2000 ANNUAL RESIDENT HATCHERIES REPORT

March 2001
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RESIDENT FISH HATCHERIES
2000 ANNUAL REPORT

Resident fish hatcheries reared and stocked over 31 million fish weighing 1.2 million pounds. More than 2,500 stocking trips were made to plant fish in over 500 waters in the state.

Resident hatchery program costs were 2.1 million dollars for an average cost of $1.56 per pound or $0.06 per fish. Costs varied greatly between the hatcheries. Cabinet Gorge Hatchery had the lowest cost per fish at $0.010, while Ashton Hatchery had the highest at $0.25 per fish. This is due to the great diversity in the resident hatchery system goals. Cabinet Gorge Hatchery produced 17 million kokanee *Oncorhynchus nerka* averaging 1.53 inches in length using a seven month growing season and Ashton Fish Hatchery used the entire 12 months of fish production and produced an average 7.3 inch rainbow trout *O. mykiss*. Of particular note was the record kokanee egg-take at the Cabinet Gorge Hatchery. This hatchery collected over 22 million eggs and produced over 17 million fingerlings from Lake Pend Oreille kokanee.

Rainbow trout of catchable size (8 to 12 inches) accounted for approximately one-half the program costs at approximately $1 million.

The Resident system increased the labor force available. Three of the seven positions lost during the period 1995 to 1999 were reinstated. The Grace Hatchery is now up to full staffing; the Hagerman hatchery regained the Fish Culturist position lost in 1997; and the Cabinet Gorge Hatchery gained a Fish Culturist position. The Clark Fork Hatchery was closed down during 2000 and as a result, the Fish Hatchery Manager II and the Fish Culturist positions were lost. Since 1995, the resident hatchery system has lost a total of four permanent positions.

Three captive broodstocks were maintained and spawned at the resident hatcheries, producing over 18 million eggs for various resident programs. These stocks include Kamloop and Hayspur rainbow trout maintained at Hayspur Hatchery. Westslope cutthroat trout were at the Clark Fork Fish Hatchery however this program has been abandoned.

The Idaho Department of Fish and Game (Department) Engineering Bureau coordinated major construction at the Grace, Hagerman, and Hayspur hatcheries this fiscal year. The head ditch associated with the large raceways at the Grace Hatchery was replaced with a pipeline, and the spring water source was collected into piping and buried. The Hagerman and Hayspur hatcheries had several roofs replaced and the Hayspur hatchery domestic water system was replaced.

Idaho Department of Fish and Game
Resident Hatcheries Fish Production
01/01/2000 – 12/31/2000

	Average									Cost/	
	Put and Take		Put Grow and Take		Fish Per	Feed		Average	Total	1000	Cost/
Hatchery	Number	Pounds	Number	Pounds	Pound	Pounds	Costs	Length	Cost	fish	pound
American Falls	196,651	56,023	591,437	22,505	10.04	77,691	$23,952.00	6.04	$127,450	$103.00	$1.62
Ashton	204,244	49,881	81,494	1,109	5.6	39,275	$11,221.84	7.3	$70,652	$247.26	$1.29
Cabinet Gorge	0	0	17,005,316	18,910	899.0	18,467	$7,514.49	1.53	$181,378	$10.67	$9.59
Clark Fork	164,503	59,047	2,212,187	18,892	30.5	41,046	$15,109.00	4.18	$82,007	$34.50	$1.06
Clearwater	499,742	103,736	1,070,187	7,506	14.11	145,416	$40,067.00	5.4	$106,110	$67.59	$0.95
Grace	273,676	39,244	365,977	5,200	14.39	61,697	$17,766.00	5.4	$154,698	$241.85	$3.48
Hagerman	793,585	319,413	2,748,975	138,495	6.63	463,676	$126,828.00	7.05	$489,672	$102.62	$0.92
Mackay	90,847	60,530	2,772,566	34,377	30.1	105,629	$33,978.00	4.5	$246,077	$85.95	$2.59
McCall	0	0	192,180	194	990.0	218	$230.57	1.3	$[a]8,661	$45.07	$44.00
Nampa	864,603	250,976	1,100,595	18,197	7.3	281,264	$81,697.00	6.7	$411,497	$209.41	$1.53
Total Produced	3,087,857	938,850	28,140,914	265,385		1,234,379	$358,364.00		$1,878,202	$60.00	$1.56

[a]Does not include catchable redistribution costs.

Total costs for each hatchery is that hatchery's total budget minus capital outlay expenditures.

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

AMERICAN FALLS FISH HATCHERY

Bill Doerr, Fish Hatchery Manager
David Billman, Assistant Fish Hatchery Manager
Paul Martin, Fish Culturist

INTRODUCTION

American Falls Fish Hatchery (AFFH) is a resident fish hatchery located on approximately 120 acres of land on the north bank of the Snake River, one-half mile below the American Falls Reservoir Dam, and two miles by road from the town of American Falls, Idaho. It is owned and operated by the Idaho Department of Fish and Game (Department)

The primary mission of the AFFH is to rear up to 250,000 catchable sized (from 9-inch to 12-inch) rainbow trout *Oncorhynchus mykiss*. The AFFH also produces fingerling (from 4-inch to 6-inch) rainbow trout, as requested. The number and lbs of fingerling produced varies from year to year.

Three permanent employees, and one 8-month temporary employee staff the AFFH. Volunteer hatchery hosts are utilized for the spring and summer tourist season.

Funding for the AFFH operation comes from license monies, from interest on an American Falls Irrigation District endowment, and from mitigation funds for the Gem State Hydropower Project at Idaho Falls.

The physical layout of the AFFH consists of ten single-pass 100-ft x 8-ft x 3-ft concrete raceways, ten reuse 100-ft x 8-ft x 3-ft concrete raceways, and a hatchery building containing fourteen 21-ft x 4-ft x 2.5-ft concrete rearing vats.

Water for the AFFH comes from Rueger Springs, which is located on AFFH property. These springs flow an average of 20 cubic feet per second (cfs) at a water temperature of 55^{o}F to 59^{o}F.

FISH PRODUCTION

The AFFH raised Hayspur strain rainbow trout, Hayspur Kamloops trout, and Troutlodge Kamloops trout for the 2000 production year. Sterile triploid versions of these strains were also raised in preparation for an all-sterile production in 2001.

Grace Fish Hatchery (GFH) received 4,700 catchable Kamloops rainbow trout (2,350 lbs) as transfers from AFFH. The AFFH stocked 126,178 catchable rainbow trout (58,523 lbs), and 657,210 fingerlings (17,655 lbs) during this period. Total stocked and transferred was 788,088 fish, weighing 78,528 lbs (Appendix 1). Net production for the year (lbs stocked + lbs on hand 12/31/2000 - lbs on hand 1/1/2000) was 84,791 lbs.

Cost in 2000 for various sizes of fish food was $23,951.70. Feed costs for the year were $0.2824 per lb of fish produced, or $0.0304 per fish. Production costs overall were $1.623 per lb of fish produced, or $0.103 per fish. This cost includes the cost of transportation to stocking waters, and the cost of fish transports stationed at the Nampa Fish Hatchery.

Feed conversion for the year averaged 0.916 lbs of feed per lb of fish produced. This low conversion rate is possible because of the tremendous numbers of flying insects available from May to October at this hatchery.

HATCHERY IMPROVEMENTS

- "Buglite Fish Feeders" were purchased for use at the large raceways. These devices use an ultraviolet bulb as an attractant, and a fan to blow insects into the raceways. This is beneficial at this hatchery where insect life is abundant.
- The public nature trail, begun in 1996, was expanded again this year.
- A half-ton pickup truck was purchased for general hatchery use as part of the 10% budget holdback from several years ago.
- Numerous elm trees that were endangering hatchery buildings and the hatchery host RV pad were trimmed back or cut down.
- Kitchen flooring in residence #1 was replaced with laminate material.

HATCHERY NEEDS

- Nineteen incubators in the hatchery building are in need of replacement. These incubators were received when a LSRCP hatchery discarded them in 1989.
- Residence #2 should be remodeled or replaced.
- Metal siding should be installed on the garage for residence #1.
- Metal or vinyl siding should be installed on residence #3.
- The automatic feeding system should be repaired.

PUBLIC RELATIONS

The AFFH received an estimated 5,000 visitors during this period, including public school groups from March through July, and again in October. We also had scout groups, family reunions, bird-watchers, drop-in visitors, hunters, and fishermen. Visitors were noted from nearly every state and from several foreign countries.

HATCHERY COMPARISON STUDY

A hatchery comparison study, first done in 1999, was repeated during the summer of 2000. Fisheries research personnel placed reward tags on catchable Kamloops rainbow trout at Hagerman, Nampa, and American Falls fish hatcheries. These fish were stocked in sixteen lakes and reservoirs in regions 3, 4, and 5. Voluntary tag returns from those waters were used to compare relative return-to-creel. In 1999, fish from the Nampa Fish Hatchery returned to the creel better than the other two hatcheries. In 2000, the American Falls Fish Hatchery took that honor.

VOLUNTEER PROGRAM

The hatchery host program, begun in 1997, was continued this year. Hosts for the 2000 season were David and Gertrude Wyatt. They turned out to be good workers, and helped the hatchery crew with conducting tours of the grounds, and with some general maintenance.

HABITAT TRAILS

The hatchery habitat trail, started in 1996, was expanded again this year. Bird-watchers from all over the United States and Canada are now using the area extensively. The Portneuf Valley Audubon Society became much more involved in use and care of the trail when several rare birds were discovered in the area.

ACKNOWLEDGMENTS

This year employees at AFFH were: Bill Doerr, Hatchery Manager I; David Billman, Assistant Fish Hatchery Manager; Paul Martin, Fish Culturist; Geraldine Carpenter, Biological Aide; and David & Gertrude Wyatt, Hatchery Hosts.

APPENDICES

Appendix 1. Fish transferred or stocked by region, American Falls Fish Hatchery, 2000.

Region	Species	Number	Pounds	Destination
Southwest	Kamloops rainbow	7,072	2,800	Region-wide
	Hayspur triploids	11,760	2,800	
Magic Valley	Kamloops rainbow	12,289	6,024	Region-wide
	Troutlodge triploids	805	575	Region-wide
Southeast	Kamloops rainbow	112,185	16,469	Region-wide
	Troutlodge triploids	20,010	9,995	Region-wide
	Hayspur rainbow	591,437	22,505	
Upper Snake	Kamloops rainbow	15,489	6,225	
	Troutlodge triploids	17,041	11,135	
TOTALS		**788,088**	**78,528**	

Appendix 2. Fish feed used during the 2000 production year, American Falls Fish Hatchery.

Source	Size/Type	Pounds	Cost
Rangen	Swim-up, Trout & Salmon Starter	280.5	$124.40
Rangen	Trout & Salmon #1 Dry	594.5	$263.66
Rangen	Trout & Salmon #2 Dry	6,173.75	$2,738.05
Rangen	Idaho Trout Grower #3 Dry	11,650	$3,559.08
Rangen	#4 Crumble	1,222	$373.32
Rangen	Extruded 450 Floating 1/8	21,470.75	$6,119.16
Rangen	Extruded 440 Floating 1/8	34,153.25	$9,713.19
Rangen	1/8 with OTC	2,020	$993.44
Rangen	#4 with OTC	126.5	$67.40
TOTALS		**77,691.25**	**$23,951.70**

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

ASHTON FISH HATCHERY

Mel Sadecki, Fish Hatchery Manager I
Damon Keen, Assistant Fish Hatchery Manager

INTRODUCTION

Ashton Fish Hatchery (AFH) is located in Fremont County, Idaho, approximately two miles southwest of the small community of Ashton. Constructed in 1920, and funded by fishing license dollars, Ashton Hatchery serves as a "specialty station," rearing four species/strains of trout, char and grayling including rainbow trout *Oncorhynchus mykiss*, cutthroat trout *O. clarki*, golden trout *O. aguabonita*, Arctic grayling *Thymallus arcticus*.

The majority of fish produced at AFH are fry and fingerling (1-inch to 6-inches) that are distributed throughout Idaho as part of various put-grow-and-take management programs. Catchable size fish (6-inches to 10-inches) are also reared at AFH and distributed locally in waters managed on a put-and-take basis.

FISH PRODUCTION

General Overview

A total of 285,738 fish (50,990 lbs) were produced at AFH this year, consisting of 81,494 fingerlings (1,109 lbs), and 204,244 catchable sized fish (including holdovers) (49,881 lbs). Although total numbers were down, total pounds produced were up from the previous year (Appendix 1). The majority of fish requests were met, with the exception of grayling. Production costs (excluding capital outlay and fish transport) were $66,350.14, with $11,221.84 spent on fish feed and the remaining $55,158.58 spent on general hatchery operations and personnel costs. Fish transportation cost for 2000 was $4,301.58. The average cost per lb of fish produced was $1.29 (Appendix 1).

All of the fish reared at AFH were received as eyed eggs (Appendix 2).

All fry and fingerlings were fed by automatic belt feeders that dribbled feed into the tanks and raceways 8 to 10 hours per day. Human disturbance was kept to a minimum, and conversions improved over hand-feeding techniques.

Demand feeders were utilized in outdoor raceways for the catchables and holdovers. Feed conversion for catchables and holdovers was 0.89 in 2000 (Appendix 3). Lights over the nursery tanks were adjusted to a moderate intensity, and growth rates were maintained by use of automatic fry feeders and covers when the fish were moved outside to the small raceways.

The average survival for all fish stocked from eyed egg to distribution was 65.3%. This is a drop of 10% due to the total loss of the grayling.

Rainbow Trout

Ashton Fish Hatchery produced and stocked 84,244 10-inch catchable rainbow (36,813 lbs) for distribution into area lakes and streams (Appendix 1). In December 1999, we received 205,000 Hayspur rainbow trout (R9) eggs. From these eggs, 42,837 R9 fingerlings, averaging 3-inches, were planted in a number of Upper Snake Region waters. An additional 120,000 (13,134 lbs) of 7-inch R9 holdovers were produced for stocking in 2001.

Henrys Lake Cutthroat Trout

Henrys Lake shipped 25,000 cutthroat trout eggs to AFH in 2000. From these, 19,621 (91 lbs) of fingerling were planted in Sublette Reservoir and Blue Creek Reservoir.

An additional group of 25,000 "genetically pure" cutthroat eggs were received and the resulting 19,000 fish (696 lbs) are being held for stocking into Golden Lake and Henrys Lake during 2001.

Golden Trout

Golden trout were not reared at AFH during 2000.

Arctic Grayling

Arctic grayling are reared at AFH for statewide mountain lake stocking. In May 2000, green eggs totaling 207,000 were transported to AFH from Meadow Lake, Wyoming. The eggs arrived in very good condition and were placed in five upwelling incubators. Approximately 60% eyed up resulting in an estimated 124,200 eyed eggs. However, all the sac fry died within a 48-hour period after hatching. We suspect, but have no proof, that herbicides caused the problem. The afternoon prior to the die-off, a local farmer was spraying weeds near a spring creek that eventually feeds into the hatchery supply. No other fish were affected. This is the first year we've had a total loss of grayling.

HATCHERY IMPROVEMENTS

The wood stoves in both residences were replaced with propane stoves this year.

Future needs include construction of a large storage area, heated shop/garage east of the Quonset hut, siding and windows for the three-car garage, septic tank/field work will be needed for both residences, as well as a new concrete driveway for residence #1.

FISH STOCKED AND TRANSFERRED

The stocking program at AFH remained similar to last year's program, with the exception of the loss of all the grayling (Appendix 4). Numbers of catchable rainbow trout on-station were more than sufficient to meet requests.

ASHTON FISH SPAWNING

Personnel from AFH traveled to Henrys Lake Hatchery to sort and spawn cutthroat trout and rainbow x cutthroat hybrids.

FISH FEED

A total of 39,275 lbs of fish feed were fed (Appendix 5) to produce 38,278.4 lbs of gain (Appendix 1), for an average conversion of 1.026. All fish were fed Rangen dry feeds.

PUBLIC RELATIONS

Approximately 1,000 people visited AFH this past year. About 500 elementary students from as far away as Idaho Falls visited the hatchery during the spring, summer, and fall. Our visitor information center answered questions about the hatchery, fishing and hunting regulations, and various Idaho Department of Fish and Game (Department) policies.

SPECIAL PROJECTS

Regional Efforts

Hatchery personnel assisted with firearms training for Hunter Education in Ashton.

HENRYS LAKE HATCHERY

FISH SPAWNING

The 2000 cutthroat trout run consisted of 4,195 cutthroat and 8,530 hybrid trout totaling 12,725 fish. Cutthroat males numbered 2,215 and cutthroat females numbered 1,980. Hybrid

males numbered 3,788 and 4,742 females were counted. Average length for male cutthroat was 440 mm and females averaged 433 mm total length. Combined average cutthroat total length was 437 mm. Hybrid trout males averaged 449 mm and females averaged 430 mm.

Cutthroat green eggs totaled 2,386,437 from 904 females for an average fecundity of 2,639 eggs per female. Eyed cutthroat trout eggs totaled 1,436,528 for an eye-up of 60.2%.

Hybrid trout green eggs totaled 993,750 from 375 female cutthroat for an average fecundity of 2,650 eggs per female. Eyed hybrid trout eggs totaled 343,798 for an eye-up of 34.6***%.*** During the 2000 trapping season we produced sterile hybrids in a production mode by our current heat-shocking method.

Brook trout were not trapped or spawned at Henrys Lake in 2000.

HATCHERY IMPROVEMENTS

The main hatchery improvements this year focused on repairing and improving the shoreline fencing and bringing the facility up to OSHA code. A great deal of time was also spent on repair of the screens and the fry traps.

In addition to hatchery work, the Henry's crew assisted the region with electroshocking, rotenone treatments on Golden Lake, fish plants, and numerous other activities.

FRY TRAPPING

Fry trapping was conducted again this year. Fry traps were monitored at Lower Duck, Middle Duck, Targhee, and Howard creeks.

RIPARIAN FENCING

The riparian sections of Henrys Lake, and Howard, Targhee, Timber, Kelly, and Duck creeks were maintained as in past years.

FISH SCREENS

The fish screens on Howard, Targhee and Duck creeks were maintained as in previous years. A number of the screens were noted for repair or possible replacement.

APPENDICES

Appendix 1. Fish production and cost, Ashton Fish Hatchery, 2000

Species	Size	Number Fish	Pounds Planted	Weight Gained In 2000	Cost/lb	Cost/fish	Total Cost
Fingerlings Produced and Stocked							
Hayspur Rainbow	2.8	42,873	328.25	323.45	16.00	.123	5,253.98
Henrys Lk Cutthroat	2.1	19,621	90.75	84.0	25.89	.119	2,349.85
Cutthroat Holdovers	4.5	19,000	0	690.0	4.02	.147	2,801.24
Totals/Ave	**3.1**	**81,494**	**419.0**	**1,097.45**	**9.48**	**.116**	**10,405.07**
Catchables Produced and Stocked							
Hayspur Rainbow	10.5	84,244	36,813	24,113	0.83	.364	30,680.84
Totals/Ave	**10.5**	**84,244**	**36,813**	**24,113**	**0.83**	**.364**	**30,680.84**
Catchables Produced For 2001							
Hayspur Rainbow	6.5	120,000	0	13,068	1.92	.21	25,264.23
Totals/Ave	**6.5**	**120,000**	**0**	**13,068**	**1.92**	**.21**	**25,264.23**
GRAND TOTAL		**285,738**	**37,232**	**38,278.4**	**1.29**	**.232**	**$66,350.14**

Appendix 2. Eggs and fish received and transferred, Ashton Fish Hatchery, 2000

Species	Eggs received	Fish received	Fish transferred	Destination
Arctic grayling	124,200	0	0	Statewide
Hayspur rainbow	[a]201,000	0	0	Region 6
Henrys Lake cutthroat	25,000	0	0	Region 6
Hayspur rainbow			7,016	Grace Hatchery
Totals	**350,200**	**0**	**7,016**	

[a]For stocking in 2001

Appendix 3. Comparative growth rates, feed conversion, and percent survival for all species reared at Ashton Fish Hatchery, 2000.

Species	Average Monthly Length Increase	Average Conversion	Percent Survival
Rainbow (catchables	.513	1.03	86.0
Rainbow (fingerlings)	.516	1.18	81.0
Cutthroat	.465	0.88	78.5
Arctic grayling	0	0	0
Holdover for 2001 stocking			
Rainbow	.459	0.78	61.0

Appendix 4. Origin of fish stocked or transferred, Ashton Fish Hatchery, 2000

Species	Source	Eggs	Fish	Destination	Stocked	Transferred	Size (inches)
Hayspur rainbow	Hayspur	[a]125,000	--	Region 6	77,228	7,016	10.5
Hayspur rainbow	Hayspur	132,000	--	Region 6	42,837	--	2.8
Henrys Lake cutthroat	Henrys Lake	25,000	--	Region 6	19,621	--	2/1
Total stocked or transferred					**139,686**	**7,016**	

[a]Received prior to 2000

Appendix 5. Feed use, Ashton Fish Hatchery, 2000

Size	Source	Pounds	Cost/lb	Total Cost
Swimup	Rangens	75	0.5924	44.43
#1 Starter	Rangens	300	0.4550	136.50
#2 Starter	Rangens	950	0.4670	443.60
#3 Starter	Rangens	1,500	0.3080	462.99
3/32 Pellet	Rangens	4,000	0.2596	1,038.40
1/8 Pellet	Rangens	32,450	0.2800	9,095.92
TOTALS		***39,275***		**$11,221.84**

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

CABINET GORGE FISH HATCHERY

John Rankin, Fish Hatchery Manager
Bruce Thompson, Assistant Fish Hatchery Manager

INTRODUCTION

Cabinet Gorge Fish Hatchery (CGFH) is located on the south bank of the Clark Fork River in Bonner County, Idaho approximately eight miles southeast of the community of Clark Fork. The hatchery was constructed in 1985 and is co-funded by Avista (formerly Washington Water Power), Bonneville Power Administration (BPA), and Idaho Department of Fish and Game (Department). The primary mission for CGFH is to produce late-spawning kokanee salmon *Oncorhynchus nerka kennerlyi* fry for release into Idaho's Lake Pend Oreille. Kokanee fry are needed to mitigate for the loss of wild kokanee recruitment caused by hydroelectric power projects in the Pend Oreille watershed. The kokanee fry releases are timed to coincide with cycles of zooplankton blooms. Maximum hatchery capacity is 20 million eggs, with fish production of 16 million two-inch fry.

Two permanent employees staff the CGFH. Thirty-three months of temporary labor are available for use during the year. Housing accommodations include two residences for the permanent staff and crew quarters for two temporary employees.

Water Supply

Cabinet Gorge Dam is located about one mile upstream from the hatchery. After its completion in 1952, artesian springs began appearing along the Clark Fork River at the present site of the hatchery. The CGFH water supply consists of approximately 4.4 cubic feet per second (cfs) from a spring and approximately 20 cfs from a wellfield. The temperatures of the lower spring and upper wellfield vary inversely with each other over a 12-month period. The cooler water from the lower springs (pumps #7 and #8) was utilized to incubate eggs until December 14, 1999. At that time, a mixture of the two water sources allowed incubation and early rearing water temperatures to be maintained around 49°F (range 44.0°F to 49.5°F). Production water temperature ranged from 38.5°F to 46.5°F.

The hatchery utilizes six pumps to move water to a common headbox. The lower spring and upper wellfield water serves the 31,000 cubic feet of rearing space in the hatchery building and the 1,500 cubic feet of space in the adult holding ponds.

Rearing Facilities

Rearing facilities at the hatchery include 192 upwelling incubators and 64 concrete raceways. The incubators are 12 inches in diameter by 24 inches high with a maximum capacity of 140,000 kokanee eggs each. In addition, a total of 30 upwelling incubators, which are 6 inches in diameter and 18 inches high, are available. The smaller incubators have a maximum capacity of 30,000 kokanee eggs each. The 64 concrete raceways have rearing space of 31,000 cubic feet. The hatchery building encloses approximately one-third of each raceway. The adult kokanee holding area consists of two holding ponds (10-ft x 30-ft each) at the head of the fish ladder. Additional adult holding is available in three holding ponds (10-ft x 30-ft each).

PRODUCTION

Between January 1 and July 1, 2000, CGFH produced a total of 17,005,316 fish weighing 18,910 lbs (Appendix 1). During the 2000 spawning season a total of 13,302,327 eggs were taken (Appendix 2).

A total of 18,467 lbs of feed produced 15,814 lbs of gain for an overall (all species reared) feed conversion of 1.17. Total production cost (less capital outlay) was $181,378.99, resulting in a cost per lb of fish of $9.59, cost per inch of fish of $0.0070, and cost per thousand fish of $10.67 (Appendix 1).

Lake Pend Oreille Kokanee

General Rearing

Fertilized eggs were brought to the CGFH and disinfected in 100-ppm PVP-iodine for 10 minutes. After enumeration, the green eggs were placed into upwelling incubators and rolled until eye-up. At eye-up the eggs were shocked, sorted, and counted with the Jensorter JHC-114 model sorter. Fry were allowed to volitionally swim out of the incubators into the raceways at 1,500 temperature units (TUs). All fry were thermally mass-marked via temperature manipulation in the raceways. Feed training began at 1,700 to 1,720 TUs.

Kokanee were feed-trained at approximately 47°F to 49°F using Rangen Trout and Salmon starter, or EWOS Vextra starter #0 for 17 days. Feed training continued from the 18th day to the 34th day, utilizing a 50:50 mix of Trout and Salmon starter and Trout and Salmon starter #1, or EWOS #0 and #1. On day 35, the fry were placed on Trout and Salmon starter #1 only. Two million fish were used in a diet comparison test comparing EWOS diet with Rangens.

Due to colder water available for early rearing, subsequent slower growth rates, and maximized swim-up fry loading rates, the majority of the kokanee on-station sustained outbreaks of Bacterial Gill Disease (BGD). Chloramine-T was administered as a treatment at 10 ppm for three consecutive days. EWOS Vextra feed, which produces less waste, was fed as a "prophylactic feed", and a 1% salt bath was used as a follow-up prophylactic measure. By necessity, the feed test was abandoned. By the end of May overall fish health had improved and all of the fry were exhibiting favorable recovery signs.

Egg collection lasted over two months, and a cross-section of the run was required for each release strategy. Growth rates were not manipulated during the 2000 season to achieve a universally sized 2-inch fry. The fish were reared using 35 monthly TUs per inch of growth. For the sixth consecutive season, fish were not taken off feed or overfed to attain the average 2-inch size parameter at release. After approximately six weeks of feed training, the fry were extended in the raceway, and water temperatures were lowered to emulate natural production in Lake Pend Oreille.

A total of 16,000,808 late kokanee fry were produced at an average length of 1.53 inches and an average weight of 865.5 fish per lb (fpp). These fish gained 15,581 lbs from 18,151 lbs of feed, resulting in a conversion rate of 1.16:1.0. Fish feed production cost was $9.65 per lb, $0.0071 per inch, and $11.14 per thousand (Appendix 1).

Survival of green eggs to feeding fry was estimated at 84% (1999, 79.8%). Survival from first feeding to release was estimated at 95.6% (1999, 99.8%), resulting in survival from green egg to release of 80.3% (1999, 79.6%).

Fish Marking

To evaluate the success of a kokanee *O. nerka kennerlyi* stocking program in Lake Pend Oreille, an otolith thermal mass-marking (Volk, et al, 1990) program was utilized at CGFH. All kokanee fry received a thermally induced otolith pattern. In addition, the eyed eggs from Clark Fork Fish Hatchery (CFFH) were transported back and forth (twice per lot) to Heath stacks set up in the adult holding ponds at CGFH. The Infectious Pancreatic Necrosis (IPN) exposed eggs were held in isolation and subjected to a warmwater thermal mark during two sequential two-day periods while at this station. Differential temperature between the two stations was about 9°F. This resulted in two distinct broad (warmwater) bands indicative of the 1999 brood year thermal marking pattern. These swim-up released fry will be distinguishable from their wild counterparts by examining otolith growth rings for these distinctive bands.

Otolith marking normally occurs between the eye-up and button-up stages, but plumbing at CGFH precluded normal procedures due to its inability to accommodate supplying two water sources of different temperatures to the incubating eggs and sac fry. The incubation vessels, however, allowed for volitional swim-up of fry into separate rearing raceways, which were plumbed to accommodate a thermal marking (Tmarking) program. This situation provided the impetus to Tmark fry near the end of button-up.

Analysis of pre-release voucher specimens (Grimm, et al. 2000) verified the presence of a recognizable otolith mark on all thermally treated fry. Although there was significant variability in the expression of the Tmark, ambiguous marks could be confirmed by carefully observing incremental patterns at the measured area where the Tmark was expected to occur.

Two factors contributed to the success of the Tmarking and recovery of the Tmarks. The first was the ability to manipulate water sources separately in each raceway without affecting the water in the other raceways. The second was the short (less than seven days) spread of the egg takes that were in each raceway. These factors allowed hatchery personnel to thermally treat groups of fry that collectively were at the same developmental stage. That is important because it places the otolith pattern in relatively the same geographic region of the otolith, making examination for and recovery of the mark much easier.

Creating and recovering the Tmark for the 1996, 1997, 1998, and 1999 CGFH kokanee brood was successful. Adjustments to spacing between thermal events will be made to the 2001 brood Tmarking effort to create artificial patterns less similar to natural daily increments patterns.

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Numbers at release were based upon Jensorter counter/sorter inventory numbers at eye-up, minus mortality. All fish were off feed for three full days before inventory pound counts were taken. Pound counts were completed on all raceways one to three days prior to fish being loaded onto the transport vehicles, or being released into the Clark Fork River. All raceways of fish were displaced onto the transport trucks during the Sullivan Springs release to double-check inventory numbers. Weight displacements were performed to support current fish inventory numbers on hand at the time of release. No weight displacements were conducted prior to releasing the fish into the Clark Fork River.

The Clark Fork River release groups were liberated at night. Only two raceways were released at one time. All unnecessary water was turned off prior to release to reduce fish congestion within the diversion box. The entire release took less than two hours.

The scheduled Sullivan Springs release group was transported in two Department tankers (3,000-gal capacity). Loading densities of small fish in the tankers was kept below 0.60 lbs per gal. Fish were planted below the bridge on the access road to the Department patrol cabin. Two tankers made five releases during the period of June 13 and 14, 2000.

The early release groups were transported in the 2-ton tanker (1,000-gal capacity) borrowed from CFFH. The tanker and truck were thoroughly disinfected before use. An additional 1,709,705 swim-up fry were released from CFFH directly into Spring Creek via a PVC pipeline.

Other Species

A total of 36,900 fall Chinook salmon were transferred to Nampa Fish Hatchery on January 19, 2000. The fish averaged 802 fpp and were 1.61 inches in length.

A total of 967,608 early kokanee salmon were transferred to Clearwater Fish Hatchery (CFH) on February 15 and 17, 2000. The fry averaged 2,434 fpp and were 1.11 inches in length.

The fish transfers were made to make room for 20 million late kokanee eggs taken from Lake Pend Oreille late kokanee adults. The early kokanee fry originated from Meadow Creek, British Columbia stock. Meadow Creek early kokanee production cost was $7.31 per lb, $0.0027 per inch, and $3.00 per thousand. Meadow Creek early kokanee survival of eyed eggs to feeding fry was estimated at 94.6%. Survival from first feeding to release was estimated at 96.5%, resulting in survival from green egg to release of 91.3%. The Chinook stock came from Big Creek Hatchery in Astoria, Oregon. Fall Chinook salmon survival of eyed eggs to feeding fry was estimated at 84%. Production costs were negligible as the fry were transferred ten days after first feeding (Appendix 1).

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- Two new electric ranges were purchased for hatchery residences to replace the original units installed in 1985.
- One of the old oven/range units was installed in the hatchery crew's quarters after extensive rewiring.
- After Brad Dredge was promoted to Hatchery Manager 2 and moved to Rapid River Hatchery, the interior of residence number two was repainted
- Flagpole illumination was installed, so the hatchery flags could be flown at night.

HATCHERY RECOMMENDATIONS

Inadequate amounts of available warm water (50°F) during production months remains the limiting factor for fish production. Although the upper wellfield can yield up to 20 cfs, it is too cold during the production cycle. Warmer water from the lower springs must be added to temper the upper wellfield water. Unfortunately, only 4.4 cfs is available from the lower springs. Modification of existing pumping facilities, or drilling additional wells at this location is warranted. The lower springs collect approximately 6 cfs of available water but the means to pump it is unavailable. Additional water at this location is also available for collection. Currently generator #1 backs up a total of 17.2 cfs (pumps #8 or #7, and #6, #5, and #4, or pumps #8, #7, #6 and #5, or pumps #5 and #4, or pumps #4 and #6) and a total of 7.2 cfs is backed up by generator #2 (pumps #3 and #8).

FISH SPAWNING

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The Clark Fork River fish trap was in operation from July 5 to December 21, 2000. Kokanee were first observed in the river on October 13, 2000. The first adult kokanee entered the trap on October 25, 2000 and trapping and spawning continued through the end of November. There were 320 adult kokanee trapped. Spawntaking records indicated 22.5% of the spawning run was female (67). From July 5 to October 16, 2000 the trap was used by Avista Corporation personnel to collect and sample bull trout. A total of 43 adult bull trout were trapped, tagged, held, and released. One male bull trout mortality was recorded. Also, one right ventral clipped female that had been originally released by hatchery personnel in 1992 was trapped. The fish was 751 mm long and weighed 9.12 lbs.

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Spawntaking and Eggs Received

Clark Fork River kokanee spawntaking began on November 9 and continued to November 30, 2000. Spawntaking activities occurred from October 30, 2000 to January 5, 2001 at the Sullivan Springs collection facility.

A total of 13,302,327 green fertilized kokanee eggs were collected during the 2000-2001 spawning season. Of those, 22,389 (2,188,146 in 1999) were obtained from 49 female kokanee at CGFH, and 13,279,938 (19,248,662 in 1999) were obtained from 33,623 female kokanee at the Sullivan Springs trap (Appendix 2).

FISH FEED

The fish produced during 2000 were fed a total of 18,467 lbs of feed. Fish feed was acquired from Rangen Inc, and a feed study was started with EWOS Vextra Feeds. The overall conversion was 1.17 lbs of feed to produce one lb of fish, not including the weight of mortality (Appendix 1).

PUBLIC RELATIONS

The surrounding communities recognize the CGFH as the major contributor of kokanee to the Lake Pend Oreille fishery. The importance of this local fishery to the local economy is presently estimated at over 5 million dollars. The hatchery has been the focus of many radio, television, and newspaper stories in recent years. With the decline of kokanee numbers in recent years even more attention is focused on the hatchery. Because of the popularity of the lake and its attractions, tourism is a booming business, and we have people from all over the world visiting the hatchery.

A total of 250 people signed our guest registration book this year. An estimated 500 visitors toured the hatchery during the 2000 season. In addition, tours were given to school groups and other organizations.

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APPENDICES

Appendix 1. Production Summary, all species, Cabinet Gorge Fish Hatchery, 2000.

Species	Number	Pounds	Length	Fish/lb	Feed Fed	Feed Cost A	Annual Cost B	Cost/lb. of fish	Cost/1,000 fish	Cost/inch of fish	Conversion
PdO KL	16,000,808	18,466	1.56	867	18,151	$7,437.27	$178,274.37	$9.65	$11.14	0.0071	1.16
Can. KE	967,608	398	1.11	2434	296	$77.32	$2,907.19	$7.31	$3.00	0.0027	1.34
Ore. FC	36,900	46	1.61	802	20	$0.00	$196.43	$4.27	$5.32	0.0033	1.85
Totals/ Average:	**17,005,316**	**18,910**	**1.53**	**899**	**18,467**	**$7,514.59**	**$181,378.99**	**$9.59**	**$10.67**	**0.0070**	**1.17**

Appendix 2. Lake Pend Oreille kokanee spawntaking summary, Cabinet Gorge Fish Hatchery, 2000.

Spawntaking Site	**Total Fish**	**Females Spawned**	**Green Eggs**	Fecundity	**Percent Females**
Sullivan Springs	94,941	33,623	13,279,938	395	45.7%
Cabinet Gorge	320	49	22,389	457	22.5%
Totals/Average	**95,261**	**33,672**	**13,302,327**	**395**	**45.6%***

* Includes male/female prespawn mortality

IDAHO DEPARTMENT OF FISH AND GAME

ANNUAL REPORT

CABINET GORGE FISH HATCHERY

2000

CORRECTED COPY

John Rankin, Fish Hatchery Manager I
Bruce Thompson, Assistant Fish Hatchery Manager

INTRODUCTION

Cabinet Gorge Fish Hatchery (CGFH) is located on the south bank of the Clark Fork River in Bonner County, Idaho approximately eight miles southeast of the community of Clark Fork. The hatchery was constructed in 1985 and was co-funded by Avista (formerly Washington Water Power), Bonneville Power Administration (BPA), and Idaho Department of Fish and Game (Department). The primary purpose for CGFH is to produce late-spawning kokanee salmon *Oncorhynchus nerka kennerlyi* fry for release into Idaho's Lake Pend Oreille. Kokanee fry are needed to mitigate for the loss of wild kokanee recruitment caused by hydroelectric power projects in the Pend Oreille watershed. The kokanee fry release is timed to coincide with cycles of zooplankton blooms. Maximum hatchery capacity is 20 million eggs, with fish production of 16 million two-inch fry.

The CGFH is staffed with two permanent employees. Thirty-three months of temporary labor are available for use during the year. Housing accommodations include two residences for the permanent staff and crew quarters for two temporary employees.

Water Supply

Cabinet Gorge Dam is located about one mile upstream from the hatchery. After its completion in 1952, artesian springs began appearing along the Clark Fork River at the present site of the hatchery. The CGFH water supply consists of approximately 4.4 cubic feet per second (cfs) from a spring and approximately 20 cfs from a well field. The temperatures of the lower spring and upper well field vary inversely with each other over a 12-month period. The cooler water from the lower springs (pumps #7 and #8) was utilized to incubate eggs until December 14, 1999. At that time, a mixture of the two water sources allowed incubation and early rearing water temperatures to be maintained around 49 degrees Fahrenheit (range 44.0°F to 49.5°F). Production water ranged from 38.5°F to 46.5°F.

The hatchery utilizes six pumps to move water to a common headbox. The lower spring and upper well field water serves the 31,000 cubic feet of rearing space in the hatchery building and the 1,500 cubic feet of space in the adult holding ponds.

Rearing Facilities

Rearing facilities at the hatchery include 192 upwelling incubators and 64 concrete raceways. The incubators are 12 inches in diameter by 24 inches high with a maximum capacity of 140,000 kokanee eggs each. In addition, a total of 30 upwelling incubators, which are 6 inches in diameter and eighteen inches high, are available. The smaller incubators have a maximum capacity of 30,000 kokanee eggs each. The 64 concrete raceways have rearing space of 31,000 cubic feet. The hatchery building encloses approximately one-third of each raceway. The adult kokanee holding area consists of two holding ponds (10-ft x 30-ft each) at the head of the fish ladder. Additional adult holding is available in three holding ponds (10-ft by 30-ft each).

PRODUCTION

Between January 1, 2000 and July 1, 2000, Cabinet Gorge Hatchery produced a total of 17,005,316 fish weighing 18,910 lbs (Appendix 1). On January 5, 2001, a total of 13,302,327 Lake Pend Oreille kokanee eggs and newly hatched fry were on hand (Appendix 2).

A total of 18,467 lbs of feed produced 15,814 lbs of gain for an overall (all species reared) feed conversion of 1.17. Total production cost (less capital outlay) was $181,378.00, resulting in a cost per lb of fish of $9.59, cost per inch of fish of $0.0070, and $10.67 per thousand fish (Appendix 1).

Lake Pend Oreille Kokanee

General Rearing

Fertilized eggs were brought to the CGFH and disinfected in 100-ppm PVP iodine for 10 minutes. After enumeration, the green eggs were placed into upwelling incubators and rolled until eye-up. At eye-up the eggs were shocked and sorted and counted with the Jensorter JHC-114 model sorter. Fry were allowed to volitionally swim out of the incubators into the raceways at 1,500 temperature units (TUs). All fry were thermally mass marked via temperature manipulation in the raceways. Feed training began at 1,700 to 1,720 TUs.

Kokanee were feed trained at approximately 47°F to 49°F using Rangen's Trout and Salmon starter (or Ewos Vextra starter #0) for 17 days. Feed training continued from the 18th day to the 34th day utilizing a 50:50 mix of Trout and Salmon starter and Trout and Salmon starter #1(or Ewos #0 and #1). On day 35 the fry were placed on Trout and Salmon starter #1 only. The fry normally would remain on Trout and Salmon starter #1 for the duration of rearing (with the exception of the Ewos feed test originally scheduled for 8 raceways, 2,000,000 fish).

Due to colder water available for early rearing, subsequent slower growth rates, and maximized swim-up fry loading rates, the majority of the kokanee on station sustained outbreaks of Bacterial Gill Disease. Chloramine-T was administered as a treatment at 10 ppm for three consecutive days. EWOS Vextra feed (which produces less waste) was fed as a "prophylactic feed", and a 1% salt bath was used as a follow-up prophylactic measure. By necessity, the feed test was abandoned. By the end of May, overall fish health had improved and all of the fry were exhibiting favorable recovery signs.

Egg collection lasts over two months, and a cross-section of the run is required for each release strategy. Growth rates were not manipulated during the 1999 season to achieve a universally sized 2-inch fry. The fish were reared using 35 monthly TUs per inch of growth. For the sixth consecutive season, fish were not taken off feed or overfed to attain the average 2-inch size parameter at release. After approximately 6 weeks of

feed training, the fry were extended in the raceway, and water temperatures were lowered to emulate natural production in Lake Pend Oreille.

A total of 16,000,808 late kokanee fry were produced at an average length of 1.56 inches and an average weight of 865.5 fish per lb. These fish gained 15,581 lbs from 18,151 lbs of feed, resulting in a conversion rate of 1.16:1.0. Fish feed production cost was $9.65 per lb, $0.0071 per inch, and $11.14 per thousand.

Survival of green eggs to feeding fry was estimated at 84.0% (1999, 79.8%). Survival from first feeding to release was estimated at 95.6% (1999, 99.8%), resulting in survival from green egg to release of 80.3% (1999, 79.6%).

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To evaluate the success of a kokanee *Oncorhynchus nerka kennerlyi* stocking program in Lake Pend Oreille, an otolith thermal mass marking (Volk, et al, 1990) program was utilized at Cabinet Gorge Hatchery. All kokanee fry received a thermally induced otolith pattern. In addition, the eyed eggs from Clark Fork Hatchery were transported back and forth (twice per lot) to Heath stacks set up in the adult holding ponds at Cabinet Gorge Hatchery. The IPN exposed eggs were held in isolation and subjected to a warmwater thermal mark during two sequential two-day periods while at this station. Differential temperature between the two stations was about 9°F. This resulted in two distinct broad (warmwater) bands, indicative of the 1999 BY thermal marking pattern. These swim-up released fry will be distinguishable from their wild counterparts by examining otolith growth rings for these distinctive bands.

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The CGFH staff would like to thank the Cabinet Gorge Dam and Northern Lights personnel for their continued cooperation with hatchery operations. Thanks also to the Lake Pend Oreille Idaho Club, Bonner County Sportsmen's Association, numerous volunteers, and various regional and hatchery Department personnel for their cooperation during the spawning season. The staff would also like to thank CGFH Maintenance Craftsman Dave Heiman, and CGFH Biological Aides Beth Brown, Stacey Taylor, John Suhfras, Sheryl Skaggs, Gennie Hoyle, Joe Rakes, and David McElhaney for their dedication and hard work in making 2000 a successful year.

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APPENDICES

Appendix 1. Production Summary, all species, Cabinet Gorge Fish Hatchery, 2000.

Species	Number	Pounds	Length	Fish/lb	Feed Fed	Feed Cost A	Annual Cost B	Cost/lb. of fish	Cost/1,000 fish	Cost/inch of fish	Conversion
PdO KL	16,000,808	18,466	1.56	867	18,151	$7,437.27	$178,274.37	$9.65	$11.14	0.0071	1.16
Can. KE	967,608	398	1.11	2434	296	$77.32	$2,907.19	$7.31	$3.00	0.0027	1.34
Ore. FC	36,900	46	1.61	802	20	$0.00	$196.43	$4.27	$5.32	0.0033	1.85
Totals/ Average:	**17,005,316**	**18,910**	**1.53**	**899**	**18,467**	**$7,514.59**	**$181,378.99**	**$9.59**	**$10.67**	**0.0070**	**1.17**

Appendix 2. Lake Pend Oreille kokanee spawntaking summary, 1999.

Spawntaking Site	Total Fish	Females Spawned		Green Eggs	Fecundity	Percent Females	
Sullivan Sps.	193,915	57,971		20,000,858	345	36.20%	
Cabinet Gorge	31,625	7,326		2,382,672	325	31.42%	*
Totals/Ave:	225,540	65,297	0	22,383,530	343	35.48%	

* includes male/female prespawn mortality

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

CLARK FORK FISH HATCHERY

John Rankin, Hatchery Manager

INTRODUCTION

The Clark Fork Fish Hatchery (CFFH) is a resident species hatchery located on Spring Creek, 1.5 miles northwest of Clark Fork, Idaho. In August 2000, CFFH was closed to all fish production. The fish virus, Infectious Pancreatic Necrosis (IPN), was found in the hatchery's water source and the Department chose to close the hatchery to help reduce the potential spread of this virus to other waters or hatcheries. Traditionally, 15,000 westslope cutthroat trout *Oncorhynchus clarki lewisi* broodstock were held on-station, providing the state's largest captive source of westslope cutthroat eggs. In addition to westslope cutthroat, brook trout *Salvelinus fontinalis*, brown trout *Salmo trutta*, golden trout *O. aguabonita*, Kamloops rainbow trout *O. mykiss*, Arctic grayling *Thymallus arcticus*, and kokanee *O. nerka kennerlyi* were reared for distribution in the waters of the Panhandle Region. A target goal of 125,000 rainbow trout >9 inches are distributed to the put-and-take fishery from March through October. For the 2000 plants, 39,100 of these trout were transported from production hatcheries in southern Idaho and 110,698 fish were grown locally.

FISH PRODUCTION

Trout production at the CFFH for 2000 addressed three different objectives: 1) final rearing of 120,000 rainbow trout for the put-and-take fishery in Region 1 (Appendix 1); 2) production of 386,000 westslope cutthroat trout to 4 inches for large lake stocking; and 3) evacuation of all remaining fish on the hatchery.

During March and April 2000, 119,692 (13,010 lbs) BY98 six-inch-plus westslope cutthroat trout were released into Lake Pend Oreille. The BY99 westslope cutthroat were distributed to: Hayden Lake - 106,250 (1,250 lbs), Lake Pend Oreille - 190,400 (2,550 lbs), and various lowland lakes - 86,140. In April, 307,000 domestic Kamloops rainbow trout fingerlings were transported from Mackay Hatchery and released into Region 1 waters.

The northern Idaho mountain lake stocking program of westslope cutthroat trout and domestic Kamloops rainbow trout was transferred to McCall Fish Hatchery in 1999 due to disease concerns at CFFH. All North Idaho mountain lakes were stocked directly from McCall Fish Hatchery using fixed-wing aircraft. This program will be transferred to Sandpoint Fish Hatchery in 2001.

There were 149,798 (52,072 lbs) of rainbow trout >9 inches long stocked or transferred by the CFFH in 2000. Of these, 110,698 (35,066 lbs) were reared on-station, while another 39,100 were transferred in from the American Falls and Nampa fish hatcheries.

There were no rainbow trout eggs received from off-station in 2000 in anticipation of CFFH being closed, and catchable fish production for northern Idaho being moved to another location.

Annual costs to rear fish at CFFH, plus additional costs incurred to deliver these fish to the release site are shown in Appendix 2. The costs included transportation of all put-and-take rainbow trout to Mullan Fish Hatchery (MUFH) for redistribution.

In December 1999, CFFH received 2,382,672 green Kokanee eggs from Cabinet Gorge Fish Hatchery (CGFH). These were excess eggs above Cabinet's production needs. At swim-up stage these fish were direct released into Spring Creek. A total of 1,709,705 un-fed Kokanee fry were released on May 5, 2000.

SANDPOINT HATCHERY

There was no fish production at Sandpoint Fish Hatchery during 2000. It will be re-opened in March 2001 as a catchable redistribution station.

HATCHERY IMPROVEMENTS

There were no major improvements to operations during 2000.

FISH STOCKED AND TRANSFERRED

The CFFH program distributes fish in the Panhandle Region as directed by Department fishery management. The program includes distributing rainbow trout for put-and-take fisheries; distributing rainbow trout and cutthroat trout fingerlings for put-grow-and-take fisheries; and redistributing warm and coldwater game fish into the Panhandle Region.

Personnel from CFFH stocked 92,998 (35,211 lbs) size three (>9 inches) rainbow trout to waters of the Panhandle Region north of Coeur d'Alene, from March to July 2000. Of these, 39,100 (17,006 lbs) were received from the American Falls and Nampa hatcheries and 53,898 (18,205 lbs) were reared from egg to release at the CFFH and stocked to the put-and-take fishery. In 2000, 55,190 (16,923 lbs) rainbow trout were reared at the CFFH for release from the MUFH.

FISH SPAWNING

There was no spawning done at CFFH in 2000. All of the remaining westslope cutthroat broodstock on station were released into Region 1 lowland lakes and streams.

FISH FEED

Production feed was purchased from Rangen Inc (Buhl, Idaho) in compliance with Idaho State contracting procedure. The feed projection program uses Haskell's formula with Delta L adjusted for expected monthly water temperature. Data on Spring Creek daily water temperature has been collected since 1980; and feed tests utilizing a variety of diets, feed delivery techniques, and rearing densities since 1989, have been utilized to institute the current program. Feed utilized and total cost during 2000 can be found in Appendix 3. A feed study was started in 1999 on the BY99 cutthroat using EWOS, Moore-Clark, and Rangen feeds. All of the feed from EWOS was donated to the hatchery. Results from the study will be summarized in a separate document.

PUBLIC RELATIONS

Public relations efforts in 2000 were similar to those of previous years, with a high level of interaction with the public. Hatchery personnel made a concerted effort to speak with as many people as possible. As always, numerous tours were scheduled and provided to public and private school groups, as well as families. A visitor information pamphlet provides a summary of information to complement the visitor information center and has been well accepted by the public.

The CFFH was again the site of a Free Fishing Day angler's clinic, with approximately 100 participants. Staff from the two local hatcheries, the local Conservation Officer, and volunteers took part in the all day event. The public actively participated in this Free Fishing Day experience with many younger anglers catching their first fish.

The hatchery staff attended public hearings and sportsmen's club meetings in an effort to get the Department's programs and policies out.

FISH HEALTH/CONDITION PROFILE

There were no viruses detected in any of the fish reared at CFFH during 2000. Cold Water Disease (CWD) was detected in early 2000 in one raceway of cutthroat trout fingerlings, but feeding Oxytetracycline (OTC) successfully treated it.

ACKNOWLEDGMENTS

The CFFH would like to thank hatchery staff Bio-aides John Suhfras and Wayne Martin for their help in making 2000 a successful year.

APPENDICES

Appendix 1. Fish production at the Clark Fork Fish Hatchery, January 1, 2000 to December 31, 2000.

Species/Strain	Source	Beginning Number	Beginning Pounds	Ending Number	Ending Pounds	Number Stocked	Pounds Stocked	Destination
Westslope cutthroat, BY94	Clark Fork	1,921	2,233	0	0	595	850	Hayden Cr.
Westslope cutthroat, BY95	Clark Fork	4,490	5,102	0	0	810	900	Fish Cr.
Westslope cutthroat, BY96	Clark Fork	8,668	3,994	0	0	7,450	3,725	Mirror/Round/Antelope
Westslope cutthroat, BY97	Clark Fork	9,909	2,202	0	0	5,850	1,500	L. Twin
Westslope cutthroat, BY98	Clark Fork	126,726	10,303	0	0	119,692	13,010	L. Pend Oreille
Westslope cutthroat, BY99	Clark Fork	417,259	2,396	0	0	382,790	5,287	Lowland Lakes
Kokanee, BY98	L. Pend Oreille	2,468,875 eggs	0	0	0	1,709,705	595	L. Pend Oreille
Kamloops rainbow,BY97	Hayspur	2,971	1,707	0	0	2,243	2,063	Put and Take
Hayspur rainbow, BY98	Hayspur	82,721	7,193	0	0	76,528	23,853	Put and Take
Hayspur sterile rainbow, BY98	Hayspur	32,185	3,219	0	0	31,927	9,150	Put and Take/Mullan
Kamloops rainbow, BY98	AF/Nampa	37,497	17,440	0	0	39,100	17,006	Put and Take
TOTALS						**2,376,690**	**77,939**	

Appendix 2. Cost of fish produced at the Clark Fork Fish Hatchery, January 1, 2000 to December 31, 2000.

Species	Numbers Produced	Pounds Produced	Pondside Cost to Produce	Pondside Cost/1,000	Pondside Cost/lb	Streamside Delivery Cost	Streamside Cost/1,000	Streamside Cost/lb
Westslope cutthroat,BY94,BY95, BY96,BY97 >6 inches	14,705	6,975	$6,183	$420.6	$.89	$1,374	$514.1	$1.08
Westslope cutthroat, BY98, 6-7 inches	119,692	13,010	$10,665	$89.1	$.82	$2,208	$107.5	$.99
Westslope cutthroat, BY99, <5 inches	382,790	5,287	$4,516	$11.8	$.85	$1,621	$16	$1.16
Hayspur Kamloops CF BY97	2,243	2,063	$2,138	$954.5	$1.04	$661	$1,249.5	$1.35
Hayspur Rainbow, AF/Nampa, BY98	39,100	17,006	$7,760	$198.5	$.46	$3,749	$294.3	$.68
Hayspur rainbow, CF, BY98	76,528	23,853	$18,065	$236	$.76	$7,285	$331.2	$1.06
Hayspur sterile rainbow, CF, BY98	31,927	9,150	$12,892	$403.8	$1.40	$2,380	$446.6	$1.67
Kokanee, BY98	1,709,705	295	$510	$.30	$1.73	$0	$0	$0
Total	2,376,690	77,639	$62,729	$26.4	$.81	$19,278	$34.5	$1.06

Appendix 3. Fish feed used in 2000 at the Clark Fork Fish Hatchery.

Size	Source	Pounds	Cost/lb	Total Cost
EWOS starter 1.2 mini	EWOS	466	$.03	$13.98
EWOS starter 1.2 mm	EWOS	1,284	$.03	$38.52
Moore-Clark #3	Moore-Clark	185	$.86	$159.10
Rangen starter #2	Rangen	30	$.527	$15.81
Rangen crumbles #3	Rangen	1,864	$.386	$719.50
Rangen grower 1/8	Rangen	21,875	$.38	$8,312.50
Rangen grower 5/32	Rangen	13,320	$.38	$5,061.60
Rangen brood 3/16	Rangen	2,022	$.38	$788.36
TOTALS		**41,046**		**$15,109.37**

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

CLEARWATER FISH HATCHERY

Tom Tighe, Assistant Hatchery Manager

INTRODUCTION

The Clearwater Fish Hatchery (CFH) is located in the community of Ahsahka in Clearwater County, Idaho. Ahsahka is a Native American word meaning, "where two rivers join", referring to the confluence of the North Fork of the Clearwater River to the main Clearwater River. The hatchery was built by the US Army Corps of Engineers (USACE), under the United States Fish and Wildlife Service (USFWS) Lower Snake River Compensation Plan (LSRCP), and was completed in 1991. Funding is provided by the USFWS. The hatchery is operated by the Idaho Department of Fish and Game (Department).

The primary purpose for CFH is mitigation for anadromous fish losses caused by hydroelectric dams. Anadromous fish production has yet to reach full capacity; therefore, the facility can use excess rearing containers for rainbow trout *Oncorhynchus mykiss* production.

The Department funded the resident trout program with $39,110 to cover the cost of feed, plus salary for a four-month temporary employee. Permanent staff salaries (estimated at $67,000*) were funded by the LSRCP project.

The hatchery water source is a double pipeline from Dworshak Dam, which can supply over 70 cubic feet per second (cfs) of reservoir water to the facility. Two intakes are located at the dam. The primary intake is adjustable from five feet to fifty feet to collect surface water; the secondary intake is about 200 feet below full pool level. This design allows mixing of water to target a specific temperature. About 12% of the rearing capacity is used for rainbow trout (RBT) production.

*Personnel costs are calculated at $0.61 per pound of gain.

FISH PRODUCTION

Release Year 2000

Catchable Rainbow Trout

Clearwater Fish Hatchery produced 194,489 catchable-sized rainbow trout, averaging 3.07 fish per lb (fpp), which were released in 2000 (Appendix 1). Survival from January 1, 2000 to release was 90%. Of this total, 44,521 fish were sterile rainbow (T9) utilized for Moose Creek and Elk Creek reservoirs, and for all flowing water plants in the region. The eggs for these (T9) catchables were heat-shocked at Hayspur Fish Hatchery (HFH) to induce sterility. The remaining 149,968 fish were rainbow trout (R9) and used to fulfill the remainder of the 2000 allocation.

Dobbyns Pond, Blue Lake, and Cold Springs Pond were not planted and their allotments were reallocated to other sites.

Kokanee

A decision was made for CFH to receive and raise one million kokanee from Cabinet Gorge Fish Hatchery (CGFH). On February 15 and 17, 2000 CFH received 967,608 fry from CGFH. On April 24 and 25, 2000 these fry were released into Manns Lake, Winchester Lake, and Waha Lake in the Clearwater Region; Mirror Lake, Hauser Lake, Spirit Lake, Lower Twin Lake, and Wolf Lodge Creek in the Panhandle Region; and Cascade Reservoir in the Southwest Region. A total of 912,807 fry (509.2 fpp), weighing 1,792.75 lbs were released (Appendix 1). Survival from arrival at CFH to release was 94.3%.

Fingerling Rainbow Trout

A decision was also made that Kamloops (K1) trout would be stocked into Panhandle Region waters instead of rainbow (R9) trout. This resulted in an excess of R9 eggs on hand at CFH above the allocation requirements. This excess was used to provide 157,380 fingerling-size fish (25.8 fpp) for Clearwater Region release on June 29, 2000 (Appendix 1). Of this total, 144,480 were stocked into Lucky Peak Reservoir and 12,900 were stocked into Soldiers Meadows Reservoir, fulfilling a portion of Hagerman State Fish Hatchery's allocation. Survival from egg to release was 90%.

Release Year 2001

Hayspur Stock

The CFH received five shipments of eyed eggs from HFH on November 9 and 30, 1999, December 21, 1999, and January 12 and 19, 2000. Survival for the first group of 187,766 (R9) eggs to ponding was 87%. A total of 163,411 of these fish were ponded on December 7, 1999. Survival of the second group of 51,580 (T9) eggs to ponding was 85.1%. Of these fish a total of 43,901 were ponded on January 18, 2000. A portion of the third shipment of eyed-eggs was jumbled together in transport when an R9 group and a T9 sterile group were inadvertently mixed as a result of a broken egg transport case. These eggs could not be utilized for sterile water allocations but could still be used for regular rainbow allocations. A portion of these eggs (199,502) was kept for Clark Fork Fish Hatchery (CFFH), Panhandle Region (R9) rainbow allocations. Survival of the 199,502 eggs for the Panhandle from eggs to ponding was 83.3%. Of these fish, a total of 166,093 were ponded on March 14, 2000. Upon determining that no other hatchery had a need for the remaining mixed R9/T9 eggs, 107,465 were destroyed and disposed of on December 22, 1999. Survival of the fourth group of 117,668 Kamloops eggs (K1) to ponding was 80%. Of these fish, a total of 93,941 were ponded on March 7, 2000 and will be sent to CFFH for the Panhandle Region rainbow allocation. Survival of the fifth, and last, group of 65,600 (T9) eggs to ponding was 81.4%. Of these fish, a total of 53,415 were ponded on March 14, 2000. This last shipment of T9 eggs was used as sterile substitutes for the mixed R9/T9 eggs in the third shipment.

Catchable Rainbow Trout

A total of 305,253 rainbow trout (Hayspur stock), weighing 69,826 lbs (4.37 fpp) are on hand for catchable allocations during 2001 (Appendix 1). Of this total, 72,354 are sterile rainbow (T9) which were heat-shocked at HFH to induce sterility.

FISH FEED

Rainbow Trout

A total of 128,632 lbs of feed was purchased in 2000 for rainbow trout (Appendix 2). Bulk, medicated, and starter feeds were purchased from Rangen Inc. Buhl, ID at an average cost of $0.58 per lb. Feed conversion for the year was estimated at 1.31. Of the total lbs of feed purchased for the year, 6,750 lbs were purchased with CFFH funds. An additional 15,140 lbs of surplus feed were transferred to this project at no cost (leftover steelhead and chinook feed from CFH, and leftover feed from Dworshak and Kooskia National Fish hatcheries), for a total of 143,772 lbs of feed fed.

Kokanee

A total of 1,500 lbs of #1 starter feed was purchased by CGFH, Panhandle Region in 2000 for brood year 1999 kokanee. The feed was purchased from Rangen Inc. at an average cost of $0.48 per lb. Feed conversion from arrival at CFH to release was estimated at 1.17. An additional 144 lbs of surplus feed were transferred to this project at no cost (left-over brood year 1999 starter feed), for a total of 1,644 lbs of feed fed to the kokanee.

FISH STOCKED AND TRANSFERRED

Personnel at CFH stocked 194,489 catchable rainbow trout in streams and reservoirs of the Clearwater Region in 2000 (Appendix 1). The rainbows averaged 3.07 fpp, weighed 63,380 lbs, and averaged 9.3 inches in length.

A total of 157,380 fingerling-sized rainbow were stocked jointly by CFH personnel and Hagerman State Fish Hatchery (HSFH) personnel. Of this total, 144,480 fingerlings were stocked into Lucky Peak Reservoir, and 12,900 were stocked into Soldiers Meadows Reservoir. Both plant sites were stocked on June 29, 2000. The fingerlings averaged 25.80 fpp, weighed 6,100 lbs, and averaged five inches in length.

An additional 3,300 rainbow trout reared at Kooskia National Fish Hatchery (KNFH) were stocked into Soldiers Meadows Reservoir and into Campbells Pond. These rainbows averaged 1.0 fpp, weighed 3,300 lbs, and averaged 12.8 inches in length.

Personnel from CFH assisted CGFH by rearing and distributing 912,807 (509.2 fpp) fingerling kokanee. On April 24 and 25, 2000 these fish were distributed into Mann's Lake, Winchester Lake, and Waha Lake in the Clearwater Region; Mirror Lake, Hauser Lake, Spirit Lake, Lower Twin Lake, and Wolf Lodge Creek in the Panhandle Region; and Cascade Reservoir in the Southwest Region. These fish weighed 1,792.75 lbs.

This year was difficult for fish stocking. High water delayed most of the stream stocking until late June and early July. High temperatures in August and September prevented stocking in Lewiston's Levee Pond, or Fenn Pond on the Selway River, and Powell Pond. A forest fire base camp around Powell Pond also delayed stocking. These allotments were reallocated to other sites per Regional fisheries personnel recommendations. Flexibility in release dates and fish numbers was imperative for successful stocking of 29 sites in 110 trips.

PUBLIC RELATIONS

Clearwater Hatchery and its satellites were open to visitors during the year. Tours at the main hatchery were given to 101 tourists, and to 60 seventh-grade students from Orofino Junior High. We had visitors from many states, as well as from Australia and Germany.

1. Brad George, Theresa Elliott, and three summer youth employees assisted Dworshak Hatchery during their annual open house on June 10.

2. Rene'e Hedrick and Theresa Elliott hauled 200 catchable rainbow (2 fpp) and seven trophy size trout to Orofino Creek near Pierce, Idaho for their annual 1860 Days Celebration.

SPECIAL PROJECTS

1. A total of 298 adult size fish, ranging in weight from 3 lbs to 8 lbs, were recovered from the settling pond. The crew supplemented 23 fish stocking trips with these large fish.

2. On June 12 and 13, 2000, Tom Tighe and Chris Shockman hauled 569 fish (237 lbs) tiger muskies from Columbia Basin Hatchery in Moses Lake, Washington and stocked them into Hauser Lake, Shepherd Lake, Blue Lake, and Freeman Lake in the Panhandle Region. Also, from this total, Damon Keen from CFFH took 40 fish and stocked them in Dawson Lake.

FISH HEALTH

In August, fish allocated for 2001 stocking were given a 10-day treatment of Oxytetracycline (TM) for bacterial coldwater disease at the rate of 3.75 g TM/100 lbs of fish, in accordance with Investigational New Animal Drug (INAD) levels. Fish responded well to the treatment and mortality counts declined.

APPENDICES

Appendix 1. Clearwater Hatchery resident fish production, January 1 - December 31, 2000.

2000 Catchable Rainbow

	Number of Fish	Weight (lbs)
2000 catchable rainbow on hand 1/1/00	216,399	29,325
2000 catchable rainbow liberated from 1/1/00 to 12/31/00	194,489	63,380
2000 catchable rainbow on hand 12/31/00	0	0
Production sub-total	194,489	34,055

2001 Catchable Rainbow

	Number of Fish	Weight (lbs)
2001 catchable rainbow on hand 1/1/00	391,526	145
Fingerling 2001 rainbow liberated on 6/29/00	157,380	6,100
2001 catchable rainbow on hand 12/31/00	305,253*	69,826
Production sub-total	462,633	75,781

Kokanee

	Number of Fish	Weight (lbs)
Kokanee received from Cabinet Gorge on 2/15, 2/17, 2000	967,608	387
Kokanee liberated between 2/15 and 4/25/00	912,807	1,793
Kokanee on hand 12/31/00	0	0
Production sub-total	912,807	1,406

TOTAL PRODUCTION**

Number of Fish	Weight (lbs)	Feed Fed	Conversion	Cost/per lb	Cost/1000 fish
1,569,929	111,242	145,416	1.31	$0.39	$27.84

Estimated costs include 50% of the FY-00 and FY-01 budgets and do not include permanent salaries
*****Number of 2001 rainbow on hand 12/31/00 does not equal (2001 rainbow on hand 1/1/00 minus the number of fingerling 2001 rainbow liberated) because the fish were enumerated a second time when moved from the vat room to outside giving us different numbers.
******Total production equals total catchable rainbow, fingerling rainbow and kokanee liberated between 1/1 and 12/31/00, as well as 2001 rainbow on hand 12/31/00.
******Total weight equals total weight of fish on hand 12/31/00 plus (weight fish liberated minus weight received, minus weight on hand 1/1/00)
******Conversion equals total lbs of feed fed divided by total lbs of fish produced
******Cost/lb equals total budget divided by total lbs produced
******Cost/1000 fish equals total budget divided by total number of fish produced times 1,000.

Appendix 2. Fish feed purchased and costs for the Clearwater Hatchery rainbow program, January 1 through December 31, 2000.

2000 Catchables

DATE	BRAND	FEED TYPE	WEIGHT	COST PER LB	TOTAL
1/28/00	Rangen	1/8 extr 450	19,830	$0.30	$5,849.85
4/17/00	Moore-Clark	#3 Nutra 2000	1,980	$0.94	$1,861.00
4/17/00	Moore-Clark	#2 Nutra 2000	1,496	$1.00	$1,496.00
4/17/00	Moore-Clark	#1 Nutra 2000	660	$1.04	$686.00
4/17/00	Moore-Clark	#0 Nutra 2000	572	$1.05	$600.00
4/20/00	Rangen	#3 starter	2,000	$0.70	$1,406.00
4/20/00	Rangen	#2 starter	1,500	$0.70	$1,054.50
4/20/00	Rangen	#1 starter high	700	$0.74	$520.10
4/20/00	Rangen	#0 starter high	4,500	$0.74	$334.30
Total Purchased This Year			**33,238**	**$0.80**	**$13,807.75**
* 4/19/00	Rangen	5/32 exsl 440	15,140	**Surplus Feed**	
TOTAL FEED FED			**48,378**		

*****15,140 pounds of Rangen 5/32 Exsl 440 bulk fish feed was surplus feed from steelhead rearing

2001 Catchables

DATE	BRAND	FEED TYPE	WEIGHT	COST PER LB	TOTAL
1/4/00	Moore-Clark	Nutra Plus #3	352	$0.86	$302.72
1/4/00	Moore-Clark	Nutra Plus #2	264	$0.89	$234.96
1/4/00	Moore-Clark	Nutra Plus #1	44	$0.94	$41.36
1/13/00	Bio Oregon	#2 Starter	44	$1.05	$46.30
1/13/00	Rangen	#2 Starter	20	$0.48	$96.54
6/6/00	Rangen	3/32 slow sinking	19,420	$0.27	$5,258.94
8/7/00	Rangen	#4 Medicated	2000	$0.56	$1,121.40
8/14/00	Rangen	3/32 sinking extr 450	19,730	$0.26	$5,145.56
8/18/00	Rangen	#4 crumble	550	$0.29	$160.38
10/4/00	Rangen	#4 Crumble	3,000	$0.33	$1,011.00
10/4/00	Rangen	1/8 450 sinking	29,060	$0.26	$7,578.85
10/4/00	Rangen	3/32 450 sinking	10,560	$0.26	$2,754.05
**12/12/00	Rangen	450 semi sinking	3,600	$0.26	$936.00
TOTAL			**88,644**	**$0.52**	**$24,688.06**

**On 12/12/00 we ordered 20,480 lbs of 1/8-450 sinking Rangen feed, of which 6,050 lbs were charged to the steelhead budget (36883). The remainder was charged to the rainbow budget (31814). This was done because we borrowed feed from the rainbow to feed steelhead. Of these 20,480 lbs, we only used 3,600 lbs before 12/31/00. The remaining 16,880 lbs will go on the 2001 resident report.

Appendix 2. continued

Feed bought with other budgets for Kokanee and Region 1 Rainbow

DATE	BRAND	FEED TYPE	WEIGHT	COST PER LB	TOTAL
KOKANEE					
1/28/00	Rangen	#1 starter	1,500	$0.48	$724.05
N/A	Rangen	Swim up	144		
TOTAL			**1,644**	**$0.48**	**$724.05**
REGION 1					
2/10/00	Rangen	swim-up - 3 Exsl	150	$0.48	$72.41
2/10/00	Rangen	# 1 starter	500	$0.48	$241.35
2/10/00	Rangen	#2 starter	100	$0.48	$482.70
2/10/00	Rangen	#3 grower	2,000	$0.32	$645.00
2/10/00	Rangen	Grower #4 crumble	4,000	$0.32	$129.00
TOTAL			**6,750**	**$0.42**	**$1,570.46**

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

GRACE FISH HATCHERY

Dwight Aplanalp, Assistant Fish Hatchery Manager
Steve Wingert, Fish Hatchery Manager I
Jarrett Page, Fish Culturist

INTRODUCTION

Grace Fish Hatchery (GFH) is located in Caribou County, Idaho approximately seven miles south of the community of Grace. The GFH was acquired in 1946 and is owned and operated by the Idaho Department of Fish and Game (Department). Funding is received from revenue generated by fishing license sales.

The mission of the GFH is to produce quality catchable and fingerling rainbow trout *Oncorhynchus mykiss* for stocking waters in the Southeast Region. Catchable-size trout (6 inches to 10 inches) are distributed locally on a put-and-take basis. Fingerling trout (3 inches to 6 inches) are distributed in area waters as part of various put-grow-and-take management programs. The GFH also produces specialty trout species of various sizes to meet statewide requests.

The GFH is staffed with a Fish Hatchery Manager I, an Assistant Fish Hatchery Manager, and a Fish Culturist. As a result of the license fee increase, we were able to fill the GFH Culturist position after a two-year vacancy. Two temporary employees may be hired to assist with hatchery operations.

Water for the GFH is supplied by gravity flow from Middle and West Whiskey Creek springs located on private property owned by Robert Harris. Flow was down approximately 539 gallons per minute (gpm) from 1999, with an annual average of 13.8 cubic feet per second (cfs). There is a natural fluctuation in water quantity basically opposite that from run-off and GFH biomass. Flows are at a minimum during May and June, and peak in October and November. The GFH biomass is at a maximum in May and at minimum in October. Water temperature is a constant 52^{o}F.

Fish rearing space consists of sixteen (3-ft x 1.5-ft x 13-ft) single pass GFH building vats, sixteen (4-ft x 3.5-ft x 40-ft) single pass small raceways, four (4-ft x 3.5-ft x 100-ft) single pass medium raceways, and six (14-ft x 2-ft x 300-ft) large raceways. The water for the large raceways is second-use water from the vats and small raceways that is mixed with fresh water from the middle spring. All water exiting GFH flows through a settling pond before being discharged into Whiskey Creek.

During the year 2000 the open spring water supply for the GFH was buried. During construction it was necessary to dry up the large raceways. In order to maintain statewide fish production capabilities the GFH produced and planted catchable fish early in the spring for the Hagerman, Nampa, and American Falls hatcheries. Those hatcheries in turn supplied fish back to the GFH during the construction throughout the summer and fall for stocking into Southeast Idaho waters.

FISH PRODUCTION

During 2000 the GFH cultured Bear River strain cutthroat trout (C7), Hayspur strain rainbow trout (R9), sterile Hayspur strain rainbow (T9), Hayspur Kamloops trout (K1), Trout Lodge rainbow trout (KS), and lake trout (LT).

The GFH began the 2000 calendar year with 197,538 fish weighing 31,917 lbs. A total of 32,830 catchable-size fish weighing 13,466 lbs were transferred in from three other state hatcheries and redistributed in local waters. Due to construction, and as a result of fish swapping with other hatcheries, the number, lbs, and cost of fish produced and planted reflect only the fish produced and stocked by GFH (Appendices 1 and 3). A total of 493,145 fish, at a weight of 52,821 lbs were reared and planted by GFH in brood year 2000. At the end of the year there were 146,508 fish weighing of 23,540 lbs on hand. This accounts for a total production of 639,653 fish and 44,444 lbs (Appendices 1 and 3).

All of the fish produced at GFH were received as eyed eggs from various state and private hatcheries. During brood year 2000 1,097,513 eyed-eggs of various species were received (Appendix 2).

Rainbow trout (fingerlings and catchables combined) accounted for 94.7% of the total lbs produced and 94.7% of total cost, or $3.41 per lb. Bear River cutthroat trout accounted for the remaining 5.3% of the lbs produced and 5.3% of total cost, or $3.38 per lb. Productions costs, excluding capital outlay, were $154,698 (Appendix 3).

Production costs were calculated for pondside and streamside amounts. Pondside cost is total budget minus capitol outlay, minus transportation. Streamside cost includes transportation expense (Appendix 4). These are bottom line figures and not broken out by species.

There were 907,800 fish requested and 926,700 planted for 102% achieved. See Appendix 5 for a breakdown by species.

Catchable Rainbow Trout

During 2000, the GFH began planting tributaries of the Bear River watershed with sterile or triploid (T9), catchable rainbow trout. Sterile rainbows were stocked to prevent hybridization with the native Bear River cutthroat trout.

The GFH started this calendar year with 96,043 diploid catchable trout and 52,310 triploid catchable trout. Over the course of the year, 68,760 (23,263 lbs) diploid catchable trout were planted into area waters along with 49,800 (18,542 lbs) triploids. The GFH produced 160,180 diploid catchable rainbow at a weight of 19,820 lbs, and 96,436 triploid catchables at a weight of 17,069 lbs. On December 31, 91,420 diploid (14,870 lbs) and 46,636 triploid (8,636 lbs) fish remained on-station for future planting. Three different strains of rainbow were planted: Hayspur (R9), Sterile Hayspur (T9), and Kamloops (KS). These fish converted 52,266.5 lbs of fish food at a rate of 1.42 to produce 36,889 lbs of flesh. The total cost of production was $125,951.

The GFH planted 4,700 rainbow trout totaling 2,350 lbs reared by American Falls, 10,953 rainbows totaling 4,862 lbs reared by Ashton, and 16,377 rainbows totaling 5,854 lbs reared by Nampa state hatcheries.

Fish Marking

Adipose fin removal for identification purposes was performed on one group of (T9) catchable rainbow trout in brood year 2000. Blackfoot Reservoir was stocked with 18,000 adipose-clipped fish.

Rainbow Trout Fingerlings

During 2000, 357,525 rainbow trout fingerlings weighing 7,734 lbs were planted. All were Hayspur strain (R9), sterile Hayspur strain (T9), or Trout Lodge (KS). At the end of the year there were 8,452 (34 lbs) of (T9) fingerlings on hand. These fish converted 6,795.6 lbs of feed at a rate of 1.3 to produce 5,200 lbs of flesh. Triploid fingerlings were stocked into Daniels and Devil Creek reservoirs. Daniels Reservoir received 11,250 sterile fingerlings weighing 850 lbs and Devil Creek Reservoir received 1,380 sterile fingerlings weighing 56 lbs.

Bear River Cutthroat

In 2000, 17,060 Bear River cutthroat trout, *O. clarki ssp.* (C7), were stocked as catchables by GFH. Montpelier Reservoir received 12,000 and Daniels Reservoir received the remaining 5,060.

During brood year 2000, GFH experimented by feeding the cutthroat trout 1/8 bulk feed in place of the 1/8 soft-moist fish food. The cutthroat trout performed well on this diet. The conversion rate for this lot of fish was 0.9 during the year 2000. This lot of fish consumed 616 lbs of 3/32 soft-moist and 1,478.8 lbs of 1/8 bulk feed. The overall conversion for this lot was 1.1 for the rearing period at GFH. This helped reduce fish production costs since soft-moist fish food costs 61% more than 1/8 bulk fish food.

GFH usually receives cutthroat eggs from Daniels Fish Hatchery in Wyoming; however fish pathology tests returned positive and prevented our acquisition of Bear River Cutthroat eggs in 2000.

Lake Trout

Lake Trout *Salvelinus namaycush* (LT) eggs were received in December from Story Fish Hatchery in Wyoming. Pending management decisions, the Lake Trout are scheduled to be released into Bear Lake sometime during November 2001.

Tiger Muskie

Grace Fish Hatchery planted a total of 567 tiger muskie (236 lbs) that had been reared in Washington State. Lamont Reservoir received 213 fish weighing 89 lbs; Johnson Reservoir received 106 fish weighing 44 lbs; and Condie Reservoir received 248 fish weighing 103 lbs.

Repairs and improvements

- Spring pond was covered.
- A 24-inch water supply pipeline was installed which will replace the large raceway supply flume (upon completion of new, large production and brood stock raceways in FY 2001).
- Painted and patched the 2-stall garage.
- Remodeled bathroom in residence #3.
- Capitol purchases in the amount of $8,163 were made.

NEEDED RENOVATIONS

- Install controlling inlet valves to the large raceways (scheduled for FY2001).
- Replace large raceways (scheduled for FY2001).
- Install a cleaning line on the medium raceways similar to that on the small raceways (scheduled for FY2001).
- Insulate and install heater in half of 4-stall garage (scheduled for FY2001).
- Install an auxiliary water supply pipe from the main supply line to the small raceway header to increase flow.
- Replace residences #2 and #3 domestic water lines (Residence #2 scheduled for FY2001).
- A new main line from the spring to a head box with new lines going to the vats, small, and medium raceways.
- Install baffles or extend air cleaning to the medium raceways.
- Install an underground irrigation system.
- Rewire residences #2 and #3.

FISH FEED

Rangen was the only brand of feed fed this year. A total of 61,081.6 lbs of dry feed at a cost of $17,312 was fed. A total of 616 lbs of soft-moist feed at a cost of $454 was fed to the specialty species (Appendix 6).

PUBLIC RELATIONS

The GFH staff gave several scheduled tours to local area schools, and numerous informal tours to interested general public visiting the facility. Staff also participated in the Governor's Idaho Corps of Discovery program by providing information and serving as a passport stamp point of service. The GFH staff conducted a Free Fishing Day clinic at the hatchery. During Free Fishing Day, kids 14 and under were allowed to fish the escapement pond.

APPENDICES

Appendix 1. Number and pounds of fish produced, reared, and stocked by Grace Fish Hatchery, 2000.

Species/Strain Lot #	Number (pounds) on hand 01/01/00	Number Reared & planted (pounds)	Number (pounds) on hand 12/31/00	Pounds produced	Conversion
	52,310	49,800	46,636		1.29
Triploid Rainbow Catchables	(10,109)	(18,542)	(8,636)	17,069	
	0	12,630	8,452		1.14
Triploid Rainbow Fingerlings	0	(906)	(34)	940	
	96,043	68,760	91,420		1.54
Diploid Rainbow Catchables	(18,313)	(23,263)	(14,870)	19,820	
	31,300	344,895	0		1.34
Diploid Rainbow Fingerlings	(2,568)	(6,828)	0	4,260	
	17,885	17,060	0		0.90
Cutthroat / Bear R. 00-WY-C7	(927)	(3,282)	0	2,355	
	197,538	**493,145**	**146,508**		**1.24**
Totals	**(31,917)**	**(52,821)**	**(23,540)**	**44,444**	

Appendix 2. Eyed eggs received at Grace Fish Hatchery 2000.

Species/strain	Source	Number Received	Date Received
Trout Lodge rainbow trout (KS)	Trout Lodge WA	25,000	2/2/2000
Sterile rainbow trout (T9)	IDFG Hayspur	58,333	2/7/2000
Hayspur rainbow trout (R1)	IDFG Hayspur	38,055	2/7/2000
Sterile rainbow trout (T9)	IDFG Hayspur	32,212	2/15/2000
Sterile rainbow trout (T9)	IDFG Hayspur	10,883	3/20/2000
Kamloops rainbow trout (K1)	IDFG Hayspur	12,173	3/20/2000
Sterile rainbow trout (T9)	IDFG Hayspur	23,430	4/3/2000
Trout Lodge Kams (KS)	Trout Lodge WA	400,000	6/28/2000
Sterile rainbow trout (T9)	IDFG Hayspur	8,971	10/10/2000
Lake Trout (LT)	WYGF Story WY	50,456	12/6/2000
Sterile rainbow trout (T9)	IDFG Hayspur	313,000	12/19/2000
Sterile rainbow trout (T9)	IDFG Hayspur	125,000	12/26/2000
Total		**1,097,513**	

Appendix 3. Fish production costs at Grace Fish Hatchery, 2000.

Species	Size inches	Number produced	Pounds produced	Production cost	Cost /1,000	Cost/lb.
Triploid Rbt. Catchables	10	96,436	17,069	$57,626	$598	$3.38
Triploid Rbt. Fingerlings	3-6	21,082	940	$3,138	$149	$3.34
Diploid Rbt. Catchables	10	160,180	19,820	$68,325	$427	$3.45
Diploid Rbt. Fingerlings	3-6	344,895	4,260	$14,575	$42	$3.42
Bear River Cutthroat	8	17,060	2,355	$7,969	$467	$3.38
Total		**639,653**	**44,444**	**$154,698**	**$237**	**$3.41**
Rainbow		622,593	42,089	$143,664	$231	$3.41
Cutthroat		17,060	2,355	$7,969	$467	$3.38

Appendix 4. Pondside and streamside production cost at Grace Fish Hatchery, 2000.

Pounds Produced	Pondside Cost	Pondside Cost/lb	Streamside Cost	Streamside Cost/lb
44,444	$144,565.00	$3.25	$154,698.00	$3.48

Appendix 5 Fish requested and planted by Grace Fish Hatchery, 2000.

Species	Number Requested	Number Planted		% Achieved
Catchable rainbow trout	127,550	120,815		95%
(Diploids)	42,900	84,185		196%
(Triploids)	80,650	36,630		45%
Fingerling rainbow trout	318,750	333,130		105%
(Diploids)	307,500	320,500		104%
(Triploids)	11,250	12,630		112%
Bear River cutthroat				
Fingerlings	2,000	0	(None available)	0%
Catchables	0	17,060		
Bear Lake cutthroat	15,200	0	(None available)	0%
Fine spotted cutthroat	2,000	1,750		88%
Totals	**907,800**	**926,700**		**102%**

Appendix 6. Cost of fish food fed at Grace Fish Hatchery, 2000.

Source	Diet	Size	Cost/lb.	Pounds	Total Cost
Rangen	Dry	Starter	$0.417	358	$149.00
Rangen	Dry	#1	$0.393	1,269	$498.00
Rangen	Dry	#2	$0.394	2,051	$808.00
Rangen	Dry	#3	$0.273	1,600	$437.00
Rangen	Dry	#4	$0.300	2,450	$734.00
Rangen	Extr. 450	3/32	$0.254	4,000	$1,014.00
Rangen	Extr. 450 Bulk	1/8	$0.277	49,354	$13,671.00
SUB-TOTAL				**61,082**	**$17,312.00**
Rangen	Soft-moist	3/32	$0.738	616	$454.00
SUB-TOTAL				**616**	**$454.00**
GRAND TOTAL				**61,698**	**$17,767.00**

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

HAGERMAN FISH HATCHERY

Joe Chapman, Fish Hatchery Manager II
Walt Rast, Fish Hatchery Manager I
Kevin Price, Fish Culturist
Bill Stutz, Fish Culturist
Ken Taylor, Transport Operator

INTRODUCTION

Hagerman Fish Hatchery (HFH) is a state-owned resident trout production facility. The HFH raises several strains of rainbow trout *Oncorhynchus mykiss* and various specialty species for statewide distribution. The HFH is the Idaho Department of Fish and Game's (Department) largest resident trout production facility. Built in 1947, it is located approximately 30 miles west of Twin Falls on the Snake River.

Funding is provided primarily through Department license money. The HFH used approximately $429,016 from Hagerman's budget, $14,664 from Dworshak mitigation monies, and $45,992 from the fish transportation budget to rear and stock fish in the 2000 production year, not including capital outlay expenditures (Appendix 1).

The HFH is staffed with a Hatchery Manager II (Joe Chapman), a Hatchery Manager I (Walt Rast), two Fish Culturists (Kevin Price and Bill Stutz), and a fish transport operator (Ken Taylor). About 15 months of temporary labor is available for use during the year from the Hagerman budget.

The HFH water supply consists of approximately 52 cubic feet per second (cfs) from Tucker Springs during the winter and 47 cfs during the irrigation season. An additional 69 cfs is supplied from Riley Creek, although the quantity and quality fluctuates seasonally. The Tucker Springs water serves the 2,045 cubic feet (cuft) of rearing space in the HFH building, 10,530 cuft of rearing space in the fingerling ponds, and up to 138,000 cuft of rearing space in the large production raceways. Riley Creek water supplies the 165,600 cuft of rearing space available in eight additional raceways. The Tucker Springs water is a constant 59^{o}F year-round and Riley Creek fluctuates from 50^{o}F to 67^{o}F annually.

HATCHERY PRODUCTION

During 2000, HFH stocked 3,542,560 fish weighing 457,908 lbs. Of these, 793,585 were stocked 8 inches long or longer, and 2,748,975 were stocked smaller than 8 inches long (Appendix 1). About 55.1% of the total fish raised were stocked in the Magic Valley Region waters (Appendix 2). The majority of the larger fish were Kamloops rainbow trout from Troutlodge Inc, with the balance from Hayspur Fish Hatchery. The 4 to 8 inch fish consisted of rainbow trout, Kamloops trout, and Coho salmon *O. kisutch* (Appendix 1).

The fish transport operator, Ken Taylor, logged 23,636 miles delivering fish to state waters, while the rest of the crew logged 20,021miles. This amounted to a total of 43,657 miles and 323 stocking trips during 2000.

The HFH reared and stocked 2,748,975 fingerlings of a 3,227,200 fingerling request, or 85.2% of the request. About 500,000 Coho had to be destroyed because of possible disease concerns. Fortunately, about 200,000 eggs were acquired from a different source and yielded about 150,000 of the 500,000 fish request. About 793,585 catchables of a requested 657,600 were reared and stocked, for 1.21% efficiency. The excess catchables were used to compensate for fall fingerling shortages and ease shortages at Grace Hatchery due to raceway construction. The combined fingerling and catchable stocking-to-request average was 91.2%.

The 457,908 lbs stocked included 319,413 lbs of put-and-take fish averaging 9.8 inches, and 138,495 lbs of fingerlings that averaged 4.8 inches. The cost of planting the average 7.7 fpp, 6.6 inches was approximately $0.86 per lb, or $111.76 per 1,000 fish (Appendix 1).

In addition to the fish reared and planted, 1,231,262 fish (75,780 lbs) were on hand at the HFH on December 31, 2000. These were comprised of 641,514 fish (74,434 lbs, average 8.6/lb, or 6.4 inches) in the large raceways and 589,748 fingerlings (1,346 lbs, average 438/lb, or 1.7 inches) in the west raceways. The cost of producing the larger fish was $1.00/lb or $116.50/1,000, and $14.12 /lb or $31.74/1,000 for the fingerlings (Appendix 1).

On hand January 1, 2000 were 1,581,287 fish (103,604 lbs). The HFH also received 9,354 lbs of fish from other hatcheries. Consequently, these subtractions yield a net production for 2000 of 2,053,610 fish (420,730 lbs), mortality excluded (Appendix 1).

A total of 8,406,675 eggs and fry were acquired to yield the fish produced. About 2,364,725 eggs were purchased, and the balance was acquired from government sources at no cost (Appendix 4). Of the 7,215,690 eggs received, 4,303,367 were received for the fish planted, and the balance was used for 2001 production. Eggs were sent to Magic Valley Hatchery to alleviate overcrowded conditions here; then transferred to Hagerman Hatchery when they were about 123.4/lb. (2.6 inches). Because of the success last year, eggs were again shipped to Magic Valley Hatchery for early rearing and will be transferred here in January and February of 2001.

The overall survival rate increased last year by about 45%. Losses to Infectious Hematopoietic Necrosis Virus (IHNV) were lower, while treatments for coldwater disease (CWD) increased (Appendix 3). Historically, mortality from IHNV is significantly higher than losses from CWD. Causes for the improved survival include: decreased production requests, healthy fish from Magic Valley Hatchery that did not suffer high losses to IHNV, and the final phase of the bird exclosure was completed.

In addition to the requests from the regions, the HFH crew also hauled and stocked 1,208,339 fish from other sources (Appendix 7). These included 62 white sturgeon, some of which were College of Southern Idaho origin; 19,444 channel catfish from Fish Breeder's of Idaho (Leo Ray); 224,000 excess steelhead from Magic Valley Hatchery; 265,508 post-smolt steelhead from Niagara Springs Hatchery; 291,790 fingerling steelhead from Niagara Springs Hatchery; 8,400 excess rainbow trout from Whitewater Hatchery; 500 excess male rainbow trout from Pisces Hatchery; 355 tiger muskies from Moses Lake Hatchery, Washington; and 398,250 trout from Grace Hatchery.

FISH FEED

The fish produced during 2000 were fed a total of 463,676 lbs of feed acquired from Rangen Inc, and Moore-Clark (Appendix 5). The net weight gained during 2000 was 420,730 lbs, which resulted in an overall conversion of 1.10 lbs of feed to produce one lb of fish, not including the weight of the mortalities (Appendix 5).

HATCHERY IMPROVEMENTS

Numerous improvements were completed this year and are listed below:

- The walkway at the Riley Creek intake was replaced and the area was fenced
- Security lights were installed around the periphery of the hatchery, and motion sensor lights were installed at the traveling screen and at the Riley Creek intake
- The final phase of the bird exclosure project was completed
- A heat pump was installed in residence #3
- A deck was installed on residence #3
- A carport was installed for residence #2
- Major plumbing repairs were completed in residences #1, #2, and #5
- The hoist system on the traveling screen was changed, and several modifications were made to the structure to make it work more efficiently
- Braces were constructed for the dam boards on Riley Creek raceways
- New carpet was installed in residences 2 through 5
- A gate was constructed at the Riley Creek bridge on the road entrance from highway 30
- A chain-link fence was installed around residence #5
- New irrigation lines were installed in areas that were previously irrigated with a garden hose
- The interior of residences #3 and #5 were painted

PUBLIC RELATIONS

The HFH received a large number of visitors and sportsmen throughout the year. An estimated 22,000 visitors toured the facility and used the surrounding public grounds this year. The 37 acres of HFH property are surrounded by 880 acres of the Hagerman Wildlife Management Area (WMA). The WMA provides a large variety of outdoor experiences, including fishing and hunting, wildlife viewing, and family picnic uses.

Hatchery personnel were called upon to give numerous school tours during the spring and fall, and several talks were presented to regional personnel and civic groups. The hatchery

sponsored a Free Fishing Day clinic here and had about 300 participants. The Magic Valley Bassmasters, Idaho Walleye Unlimited, Hagerman Boy Scouts, Hagerman National Hatchery personnel, and personnel from the Department helped out. Pepsi, Falls Brand Meats, Johnson Worldwide Associates, and Trader Jack's Sporting Goods in Hagerman contributed to the event.

Again this year, a monthly article was contributed to the Hagerman newspaper, the "Fish Wrap" to keep local anglers informed about fishing hotspots, tips, and miscellaneous fishing adventures.

Also this year, a "Trout in the Classroom" program was initiated at Hagerman Elementary School for fifth graders. Three lessons were given, and included delivery of eggs and habitat needs, spawning, and fish anatomy.

FISH TAGGING OPERATIONS

The HFH crew participated in two tagging operations during the year, in which fish were marked (Appendix 6). About 17,100 ad-clipped catchables were stocked into Blackfoot Reservoir in the fall. The purpose of the clipping was to determine the difference in return-to-creel between catchable and fingerling stocking.

Another study was initiated to determine harvest returns between three hatcheries: Hagerman, Nampa, and American Falls. This year, Hagerman had only one site, Riley Creek. About 200 fish from each water source (three total) were jaw-tagged and stocked into 15 lakes. The results will be evaluated this winter.

ACKNOWLEDGMENTS

Thanks to the permanent HFH staff of Joe Chapman, Walt Rast, Kevin Price, and Bill Stutz; to the transport operator Ken Taylor; and to the temporaries Larry Miller, Tom Kent, and Kelly and Andrea Buhler.

The regional fisheries and enforcement personnel Fred Partridge, Dave Teuscher, Doug Megargle, Richard Holman, and Gary Hompland also deserve our gratitude. Also, thanks to Niagara Springs and Magic Valley Fish hatcheries personnel for their cooperation this year.

APPENDICES

Appendix 1. Costs of fish produced at Hagerman Fish Hatchery 2000. Costs reflect all costs budgeted except capital outlay, and include $45,992 of the fish transportation budget.

Species/Strain	Length/ Inches	Number Produced	Weight/ Pounds	Cost to produce and plant	Cost/ 1,000
FISH ON HAND JANUARY 1, 2000					
Rainbow trout (T9, Hayspur)	8.76	16,170	4,620		
Hayspur rainbow trout	1.40	165,198	197		
Kamloops (TL) rainbow trout	10.56	24,150	12,075		
Kamloops (TL) rainbow trout	5.92	751,764	78,064		
Kamloops (KT) rainbow trout	4.75	166,405	8,074		
Kamloops rainbow trout (Hayspur)	1.42	457,600	574		
Totals	**5.26**	**1,581,287**	**103,604**		
FISH PLANTED					
Hayspur rainbow trout (T9)	10.50	16,315	7,950	$ 3,213.77	$196.98
Kamloops rainbow trout (TL,TT)	10.10	138,537	60,420	$26,249.78	$189.48
Kamloops rainbow trout, (TL)	9.70	638,733	251,043	$116,233.04	$181.97
Subtotals	**9.80**	**793,585**	**319,413**	**$145,696.58**	**$183.59**
Hayspur rainbow trout	4.70	1,182,950	54,550	$104,304.43	$88.17
Kamloops rainbow trout	4.70	1,376,065	62,445	$121,331.98	$88.17
Rainbow trout (R1, Hayspur)	4.20	39,000	1,300	$3,072..93	$78.79
Coho Salmon (WA.)	7.60	150,960	20,200	$21,523.55	$142,58
Subtotals Average	**4.80**	**2,748,975**	**138,495**	**$250,232.89**	**$91.03**
Total Planted Average	**6.63**	**3,542,560**	**457,908**	**$395,929.48**	**$111.76**
FISH ON HAND DECEMBER 31, 2000					
Kamloops rainbow trout	1.74	263,963	622	$8,616.50	$32.64
Kamloops (TL) rainbow trout	5.74	472,286	40,217	$50,857.55	$107.68
Kamloops rainbow trout	7.12	66,243	10,772	$8,848.27	$133.57
Kamloops rainbow trout	9.90	30,191	12,580	$5,607.27	$185.73
Kamloops rainbow trout (TK, Hayspur)	1.70	325,785	724	$10,390.07	$31.89
Rainbow trout (T9, Hayspur)	6.90	72,794	10,865	$9,422.87	$129.45
Totals	**5.15**	**1,231,262**	**75,780**	**$93,742.53**	**$76.14**
TOTAL FISH PRODUCED					
Planted in 2000		3,542,560	457,908		
On Hand December 31, 2000		1,231,262	75,780		
Totals		**4,773,822**	**533,688**	**$489,672.00**	**$102.62**
From other hatcheries		1,138,925	9,354		
On Hand January 1, 2000		1,581,287	103,604		
Total gained		**2,053,610**	**420,730**		

Appendix 2. Fish distribution from Hagerman Fish Hatchery, 2000.

Percent of number planted by Region									
	Number	**Pounds**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Catchables >8 inches									
Hayspur rainbow trout (T9)	16,315	7,950	-	-	-	100.0	-	-	-
Kamloops rainbow trout (TT)	138,537	60,420	-	-	1.8	58.3	22.9	17.0	-
Kamloops rainbow trout (TL)	638,733	251,043	-	-	24.1	57.7	18.2	-	-
Subtotal	**793,585**	**319,413**	-	-	**19.7**	**58.6**	**18.7**	**3.0**	-
Fingerlings <8 inches									
Hayspur rainbow trout	1,182,950	54,550	-	-	6.4	50.9	42.7	-	-
Kamloops rainbow trout	1,376,065	62,445	-	-	3.7	61.5	14.3	20.5	-
Rainbow trout (R1)	39,000	1,300	-	-	-	100.0	-	-	-
Coho Salmon	150,960	20,200	-	-	100	-	-	-	-
Subtotal	**2,748,975**	**138,495**	**0.0**	**0.0**	**10.1**	**54.1**	**25.5**	**10.3**	**0.0**
Total	**3,542,560**	**457,908**	**0.0**	**0.0**	**12.2**	**55.1**	**24.0**	**8.7**	**0.0**

Appendix 3. Fish survival from eyed-egg to stocking, Hagerman Fish Hatchery, 2000.

Species/Strain	Number planted	Eggs and Fry Received	Percent survival
Kamloops, Troutlodge (sterile)	138,537	211,700	65.44
Kamloops trout, Troutlodge	638,733	1,121,190	56.97
Kamloops trout, Hayspur	1,376,065	2,311,343	59.54
Hayspur rainbow trout	1,182,950	1,563,827	75.64
Rainbow trout (R1 Hayspur)	39,000	52,060	74.91
Coho Salmon (WA.)	150,960	202,682	74.48
Rainbow trout (T9 Hayspur)	16,315	31,550	51.71
Total	**3,542,560**	**5,494,352**	**64.48**

Appendix 4. Number of eyed-eggs and fry received, species, and source for fish produced, Hagerman Fish Hatchery, 2000.

Species/Strain	Eggs/Fry received		
	For Fish Planted	For fish on hand December 31, 2000	Source
Received as eggs			
rainbow/Kamloops	1,121,190	0	Troutlodge, Washington
rainbow/Kamloops	1,985,043	465,909	IDFG Hayspur
rainbow/Hayspur	751,202	0	IDFG Hayspur
rainbow/sterile	211,700	1,031,835	Troutlodge, Washington
rainbow/sterile	31,550	119,740	IDFG Hayspur
Rainbow/Kamloops/sterile		630,279	IDFG Hayspur
coho	202,682	664,560	Eagle Creek Hatchery
			Wash. Dept. of Wildlife
Subtotal eggs	**4,303,367**	**2,912,323**	
Received as fry			
rainbow/R9 from Magic Valley	812,625	-	IDFG Hayspur
Kamloops (Hayspur) from Magic Valley	326,300	-	IDFG Hayspur
rainbow/R1 from Hayspur	52,060	-	IDFG Hayspur
Subtotal fry	**1,190,985**	-	
Total	**5,494,352**	**2,912,323**	

Appendix 5. Fish feed used at Hagerman Fish Hatchery, 2000.

Size	Source	Pounds	Cost/pound	Cost
Str	Rangen	800	$0.37	$294.00
#1	Rangen	7,350	$0.37	$2,701.13
#1 TM	Rangen	550	$0.53	$293.65
#2	Rangen	30,850	$0.37	$11,337.38
#2 TM	Rangen	1,750	$0.53	$934.33
#3	Rangen	44,800	$0.25	$11,105.92
#3 TM	Rangen	2,750	$0.53	$1,468.23
#4 TM	Rangen	3,950	$0.53	$2,108.91
Str. Soft moist	Rangen	44	$1.00	$43.98
1/32 soft moist	Rangen	132	$0.93	$123.24
3/64 soft moist	Rangen	968	$0.90	$873.14
1/16 soft moist	Rangen	792	$0.88	$700.37
3/32 in, EXT450Float	Rangen	102,390	$0.25	$25,249.37
3/32 in, TM	Rangen	6,300	$0.46	$2,867.76
5/32 in, EXT450Float	Rangen	250,290	$0.25	$61,721.51
5/32 in, TM	Rangen	8,050	$0.46	$3,664.36
5/32 in, Romet 30	Rangen	1,250	$0.74	$930.13
Subtotal		**463,016**	**$0.27**	**$126,417.37**
#0	Moore-Clark	132	$1.06	$139.92
1.5	Moore-Clark	440	$0.48	$211.20
1.5 Beta-glucans	Moore-Clark	88	$0.68	$59.84
Subtotal		**660**	**$0.62**	**$411.96**
TOTAL		**463,676**	**$0.27**	**$126,828.33**

Appendix 6. Summary of fish marked at Hagerman Fish Hatchery, 2000.

Date Stocked	Species	Water	Number	Pounds	Clip
22-Aug	CC	Dog Creek Reservoir	2,997	678	Adipose
22-Aug	CC	Dierkes Lake	495	112	Adipose
22-Aug	CC	Wilson Lake Res.	1,998	452	Adipose
22-Aug	CC	Fernan Lake	4,500	1,018	Adipose
27-Sept	T9	Blackfoot Reservoir	17,100	9,000	Adipose
Totals			**27,090**	**11,260**	

Date Stocked	Species	Water	Number	Pounds	Clip
24-Apr	K1	Lava Lake	200	69	jaw-tagged
25-Apr	K1	Dierkes Lake	200	69	jaw-tagged
26-Apr	K1	Mountain Home Res.	200	69	jaw-tagged
27-Apr	K1	Dog Creek Res.	200	69	jaw-tagged
27-Apr	K1	Park Center Pond	200	69	jaw-tagged
2-May	K1	Sublett Reservoir	200	77	jaw-tagged
3-May	K1	Cove Arm Reservoir	200	77	jaw-tagged
4-May	K1	Little Camas Reservoir	200	77	jaw-tagged
5-May	K1	Deep Creek Reservoir	200	77	jaw-tagged
8-May	K1	Roseworth Reservoir	200	67	jaw-tagged
8-May	K1	Manns Creek Reservoir	200	67	jaw-tagged
10-May	K1	Hawkins Reservoir	200	67	jaw-tagged
11-May	K1	Magic Reservoir	200	83	jaw-tagged
12-May	K1	Featherville Pond	132	55	jaw-tagged
23-May	K1	Horsethief Reservoir	198	83	jaw-tagged
			2,930	**1,075**	

Appendix 7. Fish from other sources stocked by Hagerman Fish Hatchery, 2000.

DATE	SPECIES	NUMBER	POUNDS	LENGTH	SOURCE	DESTINATION
02-May	T9	18,000	6,000	9.4	Grace Hatchery	Blackfoot Reservoir
03-May	R9	18,000	5,625	9.2	Grace Hatchery	Chesterfield Reservoir
03-May	R9	11,150	3,600	9.3	Grace Hatchery	Twin Lakes
03-May	C7	12,000	2,182	8.0	Grace Hatchery	Montpelier Reservoir
03-May	T9	1,600	508	9.2	Grace Hatchery	Montpelier Reservoir
04-May	R9	23,000	3,833	7.5	Grace Hatchery	American Falls Reservoir
12-May	SA	13,269	3,000	8.5	Niagara Springs Hatchery	Oakley Reservoir
15-May	SA	30,940	7,000	8.5	Niagara Springs Hatchery	Cascade Res., Poison Creek
16-May	SA	30,940	7,000	8.5	Niagara Springs Hatchery	Cascade Res., Poison Creek
17-May	SA	14,656	4,000	8.7	Niagara Springs Hatchery	Mountain Home Reservoir
17-May	SA	13,260	3,0000	8.5	Niagara Springs Hatchery	Arrowrock Reservoir
18-May	SA	9,900	3,000	9.0	Niagara Springs Hatchery	Roseworth Reservoir
18-May	SA	13,200	4,000	9.0	Niagara Springs Hatchery	Salmon Falls Reservoir
17-May	R1	5600	1400	8.8	Whitewater Hatchery	Snake R.,Bell Rapids
17-May	R1	2800	700	8.8	Whitewater Hatchery	Snake R.,Sligar's
19-May	R1	30	150	20.0	Hag. Fish Culture Station	Carmela Vineyard Pond
16-June	TM	355	142	15.0	Moses Lake Hatchery,WA	Dog Creek Reservoir
20-June	SA	224,000	3,200	3.3	Magic Valley Hatchery	Roseworth Reservoir
14-July	WS	16	180	36.0	CSI via And. #3	Snake R., Sligar's
22-Aug	CC	2,997	678	10.0	Leo Ray	Dog Creek Reservoir
22-Aug	CC	495	112	10.0	Leo Ray	Dierkes Lake
22-Aug	CC	1,998	452	10.0	Leo Ray	Wilson Lake
22-Aug	CC	1,977	420	10.0	Leo Ray	Alexander Reservoir
22-Aug	CC	1,977	420	10.0	Leo Ray	Oneida Reservoir
30-Aug	WS	10	200	72.0	CSI via And. #3	Snake R., Owlsley Bridge
14-Sept	CC	5,000	96	4.0	Leo Ray	Oneida Reservoir
14-Sept	CC	5,000	96	4.0	Leo Ray	Alexander Reservoir
25-Sept	KS	314,500	2,480	2.7	Grace Hatchery	Blackfoot Reservoir
05-Oct	WS	36	720	40.0	CSI via And. #3	Snake R., Owsley Bridge

Appendix 7. Continued

DATE	SPECIES	NUMBER	POUNDS	LENGTH	SOURCE	DESTINATION
16-Oct	SA	154,015	2,725	3.6	Niagara Springs Hatchery	Cascade Res.
17-Oct	SA	17,570	350	3.7	Niagara Springs Hatchery	Paddock Reservoir
23-Oct	SA	120,205	3,200	4.1	Niagara Springs Hatchery	Salmon Falls Reservoir-dam
30-Oct	SA	51,480	1,800	4.4	Niagara Springs Hatchery	Mormon Reservoir
31-Oct	SA	50,738	1.025	3.7	Niagara Springs Hatchery	Magic Reservoir
01-Nov	SA	37,125	750	3.7	Niagara Springs Hatchery	Magic Reservoir
28-Dec	R4	300	1,200	21.0	Pisces Fish Hatchery	Riley Creek Pond
28-Dec	R4	200	800	21.0	Pisces Fish Hatchery	Frank Oster Lake #1
TOTALS		**1,208,339**	**76,044**			

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

HAYSPUR FISH HATCHERY

Bob Esselman, Fish Hatchery Manager II
Roger Elmore, Assistant Fish Hatchery Manager
Russ Wood, Fish Culturist

INTRODUCTION

Hayspur Fish Hatchery (HSFH) is a license-funded resident salmonid broodstock facility. The mission of the HSFH is production of eyed eggs. This season marked a mission change to produce triploid eyed eggs. Two captive rainbow trout *Oncorhynchus mykiss* broodstocks and one west slope cutthroat *Oncorhynchus clarki lewisi* broodstock are maintained on station. These are the Hayspur strain, Kamloops strain, and westslope cutthroat trout strain from Conner Lake, British Columbia, Canada. Personnel of HSFH maintain an on-site public campground, a general season pond fishery, and a trophy stream fishery.

The HSFH is located in Blaine County, approximately 40 miles south of Sun Valley on Loving Creek. The HSFH property is an odd shaped 105.12-acre parcel. Fish culture facilities include an incubation building, with vertical incubator stacks, isolation incubators, and egg picking apparatus. The HSFH has 20 early rearing tanks; 12 covered 24-ft circular ponds, 6 small raceways, and 6 large production raceways.

Water sources include the covered Hayspur spring that supplies 3.0 to 5.5 cubic feet per second (cfs) at 52^{o}F (11.6^{o}C), three pumped artesian wells producing 5.0 cfs at 48^{o}F to 52^{o}F (8.9^{o}C to 11.6^{o}C), and 7.4 cfs to 18 cfs of Loving Creek water at 33^{o}F to 73^{o}F (0.6^{o}C to 22.7^{o}C). The spring and wellwater are both considered specific pathogen free (SPF) water supplies.

Three permanent employees (Fish Hatchery Manager II, Assistant Fish Hatchery Manager, and Fish Culturist), and 16 months of temporary biological aide time are assigned to the HSFH. Usually, three biological aides are hired for the spawning season and one for the summer stocking season.

RAINBOW AND KAMLOOPS EYED EGG PRODUCTION

After four years of development, HSFH utilized a heat shock methodology to induce triploidy to the majority of egg lots. This represents a hatchery response to a management need through cooperation with research. Doug Megargle and Doug Marsters need to be recognized for their efforts in making this change possible. The goal is to provide sterile fish for stocking programs where indigenous species are present. Although this process added to our workload, HSFH personnel are proud to be part of responsible resident fish management.

The 2000 spawning season was a ten-month project, beginning in September and ending in June, with an egg take of 12,560,254 green eggs from 3,799 females during the year (Appendix 1). Photoperiod manipulation, or light control, has expanded "normal" spawn timing to more closely match egg production with eyed egg requests. Only 3-year-old and older rainbows and Kamloops were manipulated. We have found 2-year-olds respond poorly to photoperiod manipulation. Hayspur rainbow trout eyed egg production totaled 4,729,649; Kamloops eyed egg production totaled 4,626,427. Hagerman, Nampa, American Falls, Grace, Ashton, McCall, and Clearwater hatcheries were shipped eggs per their requests. Magic Valley Fish Hatchery received trout eggs destined for Hagerman. Value to the Department, at the current contract price of $15.00/1,000 for regular eggs and $25.00/1,000 for sterile eggs, equates to $66,445.85 and $111,108.22 respectively (Appendix 2).

REDISTRIBUTION OF CATCHABLES

Fish requested for the Big and Little Wood drainages were reared at Nampa Fish Hatchery, hauled to HSFH, and stocked by HSFH personnel. Semi-tank and trailer loads were hauled as needed to complete our requests. Area waters were stocked with 56,350 catchable sized rainbow trout. (Appendix 3).

FISH FEED

Rangen provided the 1/4-in brood feed. This food was ordered with 150-g/ton canthaxathin red additive to enhance egg color and other possible health benefits. Rangen Inc. was the source of early rearing feeds, the food for catchables, and for replacement broodstock feeds. Moore-Clark fish feed was fed to the westslope cutthroat trout on a recommendation from Peter Brown at the Kootenay Trout Hatchery, Ft. Steele, British Columbia (Appendix 4).

HATCHERY IMPROVEMENTS AND NEEDS

Improvements to the HSFH during 2000 included:

- The domestic water lines were replaced. Source water was changed from the Hayspur spring (surface water) to well #1. A heated room was constructed to house the pump and pressure tanks. Potable water from this system is also available at the enforcement shed, Camp Host site, and campground.

- The roof on the hatchery building was replaced. Cedar shakes were replaced with insulation and metal. The interior of building was painted.

- The roof on the office/crew quarters/ shop was replaced.

- Two heat shocking tanks were designed and built by Doug Marsters of Eagle Fish Health Lab.

- Modifications were made to the 1-ton fish transport tank to allow for easy handling of oxygen tanks.

- New aluminum crowd rack frames for broodstock ponds fabricated at the Salmon screen shop are currently in use.

- Approximately 120 pine trees were planted along the west side of the campground. If they grow, they should provide wind protection to the campground.

- A welding table was fabricated and the workbench in the incubation building was expanded for more workspace.

Needs of the HSFH, listed in order of priority, are:

- Build an extension on to the crew quarters to accommodate more people and to provide co-ed housing.
- Replace open headbox in hatchery building with a pipe and valves.
- Replace bird and mammal exclosure on small raceways.
- Replace roof of residence #1.
- Install an alarm system to monitor water levels and pump function.

BROODSTOCK MANAGEMENT

The Hayspur rainbow trout (R9) replacement population was developed by using year-class crosses. One-male and one-female pairings were performed with 200 pairs. These adult fish were either sacrificed for pathogen workup or adipose-clipped. Marked fish are used for production egg lots, but not used again for development of a replacement population.

Hayspur's Kamloops (K1) replacement population was developed by using three-year-old adults of mixed Trout Lodge/Skanes stock and a mixed year class population of four to six-year-old adults of Trout Lodge stock. Fish used for the replacement population were sacrificed or marked to identify them. Marked fish are used for production egg lots, but not used again for development of a replacement population.

Westslope cutthroat from Conner Lake, British Columbia were obtained from the Kootenay Trout Hatchery on July 6, 2000. Approximately 2,500 eyed eggs from sixty pairs were hatched and are currently in rearing. These fish are the start of an adfluvial broodstock to provide fry for the high mountain lake program. Eggs will be available on even years from Conner Lake. Four more groups will be obtained so as to provide a reasonable amount of genetic material from the Conner Lake population.

Pathogen status was addressed by using vaccinations and culling. All one-year-old broodstock replacements were vaccinated with a killed Flexibacter vaccine. This vaccine was developed using flexibacter cultured from Hayspur fish. Eggs are culled upon positive results from virology or bacteriological techniques. The goal is to effect pathogen status while maintaining genetic material. The trend is very encouraging in that the number of culled families was low. Only 10 sub-families total from both strains were culled this year.

PUBLIC RELATIONS

Tours were provided to area schools. Bellevue, Burley, and Hailey elementary schools; Hemingway School (Ketchum); Minico, and Wood River high schools; and two home school groups were shown the life cycle of trout and had questions answered. Organized groups that

were given tours included Flyfishers of Idaho, Good Sam RV Clubs, Carey Cub Scouts, Camp Rainbow Gold, WIN, and 4-H Clubs.

The following schools received eyed eggs: Naples, Wood River, Shelley, Murtaugh, and Kimberly High schools; Kellogg, Fairfield, and Shelley Junior High schools; Hobbs and Jerome Middle schools; and Goodsell, East Minico, and Pioneer Elementary schools. Some of the resultant fry were stocked into Adopt-a-Stream projects. Salmon region biologists used ripe adults for spawning demonstrations and anatomy lessons at Challis High School, and Leadore and Brooklyn Elementary schools. Eyed eggs were also shipped to Gebhards Creek at the Morrison Knudsen Nature Center for public viewing of the developmental stages of rainbow trout. River Glen Junior High students helped spawn fish and were given a life cycle of rainbow trout experience.

Approximately 7,000 individuals visited, camped, and/or fished on HSFH property. Gaver Lagoon continues to gain popularity with a variety of anglers including the physically challenged and children.

The HSFH campground benefited from the efforts of volunteer Camp Hosts Norm and Caroline Gates. They volunteered time to answer questions, give directions, clarify regulations, tidy outhouses, clean up litter, provide fishing tips, assist with stocking fish, and generally enhance the image of the Department.

SPECIAL PROJECTS

Loving Creek

The fishery in Loving Creek has improved since a rehabilitation project in 1991. Effort and use by campers and visitors have increased as well. Foot traffic along the angler trail has degraded the riparian area. Boardwalks were built over the damaged areas in 1999. The boardwalks were used by the anglers and successfully protected riparian vegetation. This year another impacted area was covered with a boardwalk. The Flyfishers of Idaho purchased materials, and HSFH personnel did the installation. Hatchery personnel also placed five cubic yards of spawning gravel into the rehabilitated reach of Loving Creek. Ann Elmore repainted an information sign at the parking area.

Miscellaneous

The HSFH personnel assisted Region 4 staff with depredation complaints and electroshocking of the Big Wood River. Sperm from Kamloops trout were pooled, three males per bag, and used at Henrys Lake to generate hybrids via delayed fertilization. The HSFH staff assisted Adopt-a-Wetland cooperator and the Flyfishers of Idaho to construct over 5,000 linear feet of boardwalks at the Silver Creek access owned by the Department. Senior Conservation Officer Rob Morris is living in a hatchery residence.

ACKNOWLEDGMENTS

The efforts of Biological Aides need to be recognized. Mark August, Jeff Williams, and Wade Johnson worked hard to make fishing better.

The HSFH would like to thank the people who helped out during the spawning season: Department employees Lisa Ashby, Liz Aitken, Kurt Schilling, Mel Hughes, Jeff Seggerman, Karen Frank, Zack Olson, Dave Teuscher, and Mark Davidson of the Nature Conservancy.

APPENDICES

Appendix 1. Egg production summary of Hayspur Fish Hatchery, 2000.

Species	[a]Eggs Taken	Eggs Shipped
Kamloops rainbow trout	3,362,649	2,453,735
Hayspur rainbow trout	1,401,600	1,927,289
T9s (R9s 3N)	4,021,191	2,757,304
KTs (K1s 3N)	3,665,488	2,144,182
Broodstock replacement	109,326	0
Totals	**12,560,254**	**9,282,510**

[a]Total is displaced (volumetric) of both good and bad eggs taken in 2000.

Appendix 2. Eyed-egg shipment summary from Hayspur Fish Hatchery, 2000.

Hatchery	[a]Species	Total eggs shipped	[b]Estimated value
American Falls	R9	489,058	$7,335.87
	T9	19,200	$288.00
Ashton	T9	255,000	$3,825.00
Clearwater	T9	80,000	$2,000.00
	K1	166,716	$2,500.74
Grace	R9	18,510	$277.65
	T9	571,829	$14,295.73
	K1	31,718	$475.77
Hagerman	R9	537,478	$8,062.17
	T9	169,580	$4,239.50
	K1	1,724,232	$25,863.48
	KT	668,139	$16,703.48
Magic Valley	R9	221,160	$3,317.40
	T9	771,403	$11,571.05
	KT	521,051	$13,026.28
McCall	T9	97,293	$1,459.40
Nampa	R9	192,712	$2,890.68
	T9	576,045	$14,401.13
	K1	102,781	$1,541.72
	KT	401,710	$10,042.75
Big Wood River	R9	468,371	$7,025.57
	T9	213,354	$5,333.85
	K1	355,240	$5,328.60
	KT	553,282	$13,832.05
[c]Other	T9	3,600	$90.00
	K1	73,048	$1,826.20
Totals		**9,282,510**	**$177,554**

[a]R9=Hayspur rainbow trout, K1=Kamloops rainbow trout, T9=sterile R9, KT=sterile Kamloops
[b]At contract value of $15.00/1,000 eggs, and $25.00/1,000 sterile eggs.
[c]Eggs used for trout in the classroom programs or exchanged for laboratory work.

Appendix 3. Hayspur Fish Hatchery stocking summary, 2000.

Fish size	Number of fish	Pounds of fish
Catchables	56,350	20,226
Fry	20,610	910
Totals	**76,960**	**21,136**

Appendix 4. Hayspur Fish Hatchery Feed Summary, 2000.

		Rangens		
Date	**Size**	**Amount/pounds**		**Cost**
3/9/00	1/4 in. Brood pellet	12,440	$	3,669.80
6/2/00	1/4 in. Brood pellet	12,620	$	3,569.44
8/23/00	1/4 in. Brood pellet	11,380	$	2,996.36
11/10/00	1/4 in. Brood pellet	11,500	$	3,027.95
Total		**47,940**	**$**	**13,263.55**

		Rangens		
Date	**Size**	**Amount/pounds**		**Cost**
1/5/00	Extruded 450 floating 1/8	300	$	86.25
1/25/00	Extruded 450 floating 1/8	400	$	115.00
2/16/00	Extruded 450 floating 1/8	450	$	129.38
	Idaho #3 Grower	50	$	14.90
3/7/00	Trout/Salmon starter #2	50	$	21.80
	Idaho #3 Grower	50	$	14.90
	Extruded 450 floating 5/32	700	$	201.25
3/21/00	Extruded 450 floating 5/32	200	$	57.50
4/5/00	Trout/Salmon starter #2	50	$	21.80
	Extruded 450 floating 5/32	1,000	$	287.50
5/2/00	Idaho #3 Grower	50	$	14.90
	Extruded 450 floating 5/32	900	$	258.75
5/18/00	Extruded 450 floating 1/16	400	$	143.64
	Extruded 450 floating 5/32	500	$	123.30
	Idaho #3 Grower	50	$	12.40
6/2/00	Extruded 450 floating 3/16	1,000	$	246.60
6/23/00	Extruded 450 floating 3/16	1,000	$	246.60
	Extruded 450 floating 3/32	100	$	24.66
7/11/00	Trout/Salmon starter #2	50	$	18.38
	Extruded 450 floating 3/16	650	$	24.66
	Extruded 450 floating 3/32	200	$	24.66
8/7/00	Extruded 450 floating 3/32	100	$	24.66
	Extruded 450 floating 1/8	300	$	73.98
8/23/00	Extruded 450 floating 1/8	300	$	73.98
9/21/00	Extruded 450 floating 1/8	200	$	49.32
	Extruded 450 floating 5/32	300	$	73.98
10/11/00	Extruded 450 floating 5/32	500	$	123.30
11/10/00	Extruded 450 floating 5/32	300	$	73.98
	Extruded 450 floating 3/16	300	$	73.98
11/28/00	Extruded 450 floating 3/16	500	$	123.30
	Extruded 450 floating 3/32	100	$	24.66
12/19/00	Extruded 450 floating 3/16	850	$	209.61
Totals		**11,900**	**$**	**3,013.58**

Appendix 4. Continued.

		Moore-Clark		
Date	**Size**	**Amount/pounds**		**Cost**
7/10/00	Nutra Plus #0	44	$	39.26
7/10/00	Nutra Plus #1	44	$	39.26
9/5/00	Nutra Plus #2	44	$	39.26
12/22/00	Nutra Plus #3	44	$	39.26
Totals		**176**	**$**	**157.04**

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

MACKAY FISH HATCHERY

Phil Coonts, Fish Hatchery Manager I
Robert Hoover, Assistant Fish Hatchery Manager
Douglas Young, Fish Culturist

INTRODUCTION

The Mackay Fish Hatchery (MFH) is a specialty fish production facility located approximately 16 miles north of Mackay, in Custer County, Idaho. The hatchery produces salmonids of various species and strains, from 1 inch to 16 inches in length, for statewide distribution. Funding is obtained under contract from the Dingall-Johnson Act for wages, and from state license monies for fish feed and operational costs.

The hatchery has with three full-time and two part-time employees. The part-time employees share 16 months of temporary time. Wages, including benefits, cost $138,484 for the permanent employees and $30,796 for the temporary employees. The operating budget for the calendar year, January through December 2000, was $51,000. Included in the year's production were 17 lots of fish, comprised of 5 species and 11 different strains.

Rainbow trout *Oncorhynchus mykiss*
- Arlee (Ennis NFH, MT) 3 year classes
- Kamloops (Hayspur SFH)
- Eagle Lake (Ennis NFH, MT)
- Fish Lake (Ennis NFH, MT)
- Hayspur steriles (Hayspur SFH) (2 year classes)

Cutthroat trout *O. clarki*
- Henry's Lake (Henrys Lk. SFH) 2 year classes
- Yellowstone (Jackson NFH, WY) 2 year classes

Rainbow x Cutthroat trout hybrids
- Henry's Lake cutthroat females x Hayspur SFH rainbow males

Kokanee salmon *O. nerka kennerlyi*
- Early (Deadwood Res) 2 year classes
- Early (Strawberry Res, UT)
- October (Blue Mesa Res, CO)

WATER SUPPLY

Water for hatchery production is provided by three collection springs in an artesian area at the hatchery. The area was fenced off and been dug out, then filled with cobblestone. The water volume available for hatchery production remained consistent with previous years. Flows ranged from 18 to 24 cubic feet per second (cfs). Lowest flows occur during February, while highest flows occur during July. Since the 1983 earthquake, temperatures have varied between the three different springs supplying the hatchery: one at 50°F, one at 51°F, and one at 54°F. Incubation temperature is 51°F.

HATCHERY IMPROVEMENTS

With the three permanent employees being “among the walking wounded” a good part of the year, fewer improvements were accomplished this season than normal. Some projects completed were:

- An additional settling pond was constructed to prevent overflow from the original settling pond.
- The south side of the four-stall garage was painted.
- The icemaker was repaired and thoroughly cleaned.
- Built and installed weir to measure flows in the waste effluent ditch
- Leaks in the early rearing troughs and header pipe were repaired.

HATCHERY NEEDS

- Residence #3 needs new siding, windows, and roofing installed.
- Residence #3 needs a garage built.
- Residence #2 needs the garage either rebuilt or improved.
- Residence #2 needs new siding installed.
- A fish-proof screen needs to be installed at the exit of the large raceway tailrace to keep feral fish out of the tailrace.
- Install a cement pad in front of the shop in order to perform vehicle maintenance work.

FISH STOCKED

Fingerlings of various species and strains were stocked in seven regions of the state (Appendix 1). These put-grow-and-take fish numbered 2,722,791 fish weighing 34,838 lbs.

Catchable rainbow trout (10-inches+) were stocked in the Upper Snake and Salmon regions. These put-and-take fish numbered 80,347 and weighed 57,440 lbs. Catchable cutthroat, Henry’s and Yellowstones, numbering 10,500 fish and weighing 3,090 lbs, were planted into Regions 6 and 7.

The hatchery also reared 27,450 cutthroat and 12,800 rainbow fry for planting into forty-five high mountain lakes in Regions 4 and 6. Four-wheelers, pack-stock, and foot travel were used to plant these fish.

The fish transport trucks assigned to MFH made 89 fish stocking trips during the year, planting 34 different waters and traveling 25,400 miles. Transport tankers assigned to Nampa Fish Hatchery hauled six loads of fish for the hatchery during the year.

FISH FEED

A total of 105,629 lbs of fish feed was used during the year at a cost of $33,978. Feed conversion averaged one pound of feed for every pound of fish produced. Conversions ranged from a high of 1.7 for the 1999 Hayspur steriles to a low of 0.7 for the 2000 Arlee rainbows. The steriles were intentionally overfed in an effort to duplicate sizes of an older lot of Ennis rainbow. Naturally occurring foods supplemented hatchery foods, enabling low conversions to occur. Average feed cost per lb of fish produced was $0.41.

State contract required Rangen feeds to be used exclusively. Semi-moist starter was used for kokanee, but the rest of the feed use was the dry diet. Fish health and performance showed no ill effects from the Rangen brand. All feed sizes and amounts used are shown in Appendix 3.

FISH MARKING

Of the one million cutthroat planted into Henrys Lake, 102,900 were adipose-fin clipped prior to stocking. This clipping is a never-ending study of natural vs hatchery fish returning to the creel and ladder.

The hatchery planted equal numbers of Hayspur sterile and Ennis normal magnum catchables into Ririe Reservoir during the summer, in a return-to-creel study conducted by Region 6 fisheries biologists. No results were available at this time.

PUBLIC RELATIONS

Approximately 800 people toured the hatchery during the year. Most visitors come to fish in the diversion pond below the hatchery. Scheduled tours were given to Mackay and Arco elementary classes, Boy Scout and FFA groups. The hatchery is assisting Mackay High School in an aquaculture program. The hatchery crew and the local conservation officer participated in Idaho's "Adopt a Highway" litter control program. Six miles of Highway 93 along Mackay Reservoir are cleaned bi-annually. The hatchery became a “Passport Stamping Station”, the tourism promotion program.

ACKNOWLEDGEMENTS

At various times during 2000, the Mackay Hatchery crew included Biological-Aides: Bob Evans, Adam Broussard, Travis Drussel, Brett High, and Camron Wakefield. Without their excellent assistance, we could not have accomplished all that we did during the year. Their care and concern enabled the hatchery to produce the quality of fish we do. Doug Young, Fish Culturist, Mick Hoover, Assistant Hatchery Manager, and Phil Coonts, Hatchery Manager, round out the hatchery's personnel.

APPENDICES

Appendix 1. Fish Production at Mackay Fish Hatchery, January 1 to December 31, 2000.

Species/strain	Lot	Source	Received as	Fish Number Received or Carried Into 00	Pounds Received or Carried Into 00	Number Planted	Pounds Planted	Destination
Arlee rainbow trout	9-EN-RA	Ennis NFH	eyed eggs	75,000	30,000	72,877	51,007	00 catchables
Hayspur rainbow sterile	9-R9-T9	Hayspur SFH	eyed eggs	7,600	3,000	7,470	6,433	00 catchables
Arlee rainbow trout	0-EN-RA	Ennis NFH	eyed eggs	130,635	5,844	18,525	925	01 catchables
Arlee rainbow trout	1-EN-RA	Ennis NFH	eyed eggs	159,700	eggs	0	0	02 catchables
Hayspur rainbow sterile	1-R9-T9	Hayspur SFH	eyed eggs	34,700	eggs	0	0	02 catchables
Kamloops rainbow	0-K1	Hayspur SFH	eyed eggs	457,000	eggs	317,217	3,822	00 fingerlings
Fish Lake rainbow	0-RF	Ennis NFH	eyed eggs	293,724	eggs	200,000	2,621	00 fingerlings
Eagle Lake rainbow	0-R7	Ennis NFH	eyed eggs	105,000	eggs	86,900	1,138	00 fingerlings
Henry's Lk cutthroat	8-U-ID-C3	Henry's Lk H	eyed eggs	1,550	1,000	1,520	1,650	00 catchables
Henry's Lk cutthroat	0-U-ID-C3	Henry's Lk H	eyed eggs	1,338,693	eggs	837,190	7,240	00 catchables
rainbow/cutthroat hybrid sterile	0-U-ID-RC	Henry's Lk H Hayspur H.	eyed eggs	308,286	eggs	242,830	482	00 Henry's Lk
Yellowstone cutthroat	9-C4	Jackson NFH	eyed eggs	10,913	135	9,000	1,440	00 and 01 catchables
Yellowstone cutthroat	0-C4	Jackson NFH	eyed eggs	13,048	85	0	0	01 catchables
Deadwood kokanee	9-U-ID-KE	Deadwood Res	green eggs	1,150,022	10,826	1,119,404	18,095	00 fingerlings
Deadwood kokanee	0-U-ID-KE	Deadwood Res	green eggs	848,761	9,500	0	0	01 fingerlings
Strawberry Res kokanee	0-U-UT-KE	Strawberry Res	green and eyed eggs	1,110,682	eggs	0	0	01 fingerlings
Blue Mesa kokanee	0-U-CO-KO	Roaring Judy, CO	eyed eggs	359,000	eggs	0	0	01 fingerlings

Appendix 2. Mackay Fish Hatchery Stocking Summary, 2000

Lot Number	# Planted	Pounds Planted	Size Planted
9-EN-RA	72,877	51,007	catchable
9-R9-T9	7,470	6,433	catchable
8-U-ID-C3	1,500	1,650	catchable
9-C4	9,000	1,440	catchable
0-EN-RA	18,525	925	fingerling
0-K1	317,217	3,822	fingerling
0-RF	200,000	2,621	fingerling
0-R7	86,900	1,138	fingerling
0-U-ID-C3	838,440	7,240	fingerling
0-U-ID-RC	151,830	482	fingerling
9-U-ID-KE	1,119,404	18,095	fingerling

Total Fish Planted

		Numbers	Pounds
High Mtn. Fry		40,250	54
Fingerlings		2,732,316	34,323
Total catchables		90,847	60,530
Rainbow	79,830	80,347	57,440
Cutthroat		10,500	3,090
Totals		***2,863,413***	***94,907***

Appendix 3. Mackay Fish Hatchery Feed Used, January 1 2000 through December 31, 2000

	Pounds Used		Feed Cost
Rangen Fish Feeds			
Semi-moist starter			
0 swim-up -	176		$ 187
Trout and Salmon Starter			
0 swim-up -	1,400		573
# 1 -	4,460		1,827
# 2 -	10,494		4,298
# 3 -	16,434		5,218
Extruded 450 Pellets			
Ext 3/32 -	3,769		1,206
Ext 5/32 -	68,896		20,669
Total Pounds	**105,630**	**Total Cost**	**$ 33,978**

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

MCCALL FISH HATCHERY

Steven T. Kammeyer, Assistant Hatchery Manager

INTRODUCTION

McCall Summer Chinook Fish Hatchery (MFH) is located within the city limits of McCall, Idaho, approximately ¼-mile downstream of Payette Lake, adjacent to the North Fork of the Payette River. The US Army Corps of Engineers (USACE) renovated this facility in 1979. The primary hatchery objective is to produce one million summer chinook salmon *Oncorhynchus tshawytscha* smolts annually. Anadromous funding is provided through the Lower Snake River Compensation Program (LSRCP). Facility secondary objectives pertain to resident programs. Funding for the resident fisheries program (April 1 to September 30) is provided through Idaho Department of Fish and Game (Department) license sales revenue.

Payette Lake provides all of MFH water requirements. Two water intakes are available which provide limited water temperature control through mixing. The surface intake is located at Lardo Dam at the outlet of Payette Lake. The subsurface intake extends approximately ¼-mile into Payette Lake at a depth of 50 feet. A 2-foot diameter constriction in the 3-foot diameter mainline limits maximum flow capacity to 20 cubic feet per second (cfs).

Incubation capacity consists of 26 eight-tray Heath style incubation stacks. Additional incubators may be plumbed into 6 of the early rearing vats if more incubation space is required. Rearing of resident fry is accomplished utilizing several of the 14 indoor vats. Each early rearing vat is 40-ft long x 4-ft wide. Outside rearing space consists of two concrete ponds 196-ft x 101-ft x 4-ft which are used exclusively for rearing summer chinook salmon. Outdoor ponds are joined to a common collection basin (101-ft x 15-ft x 4-ft) which is used to hold catchable size rainbow trout for redistribution in the summer.

Major resident program objectives:

- Hatch and rear westslope cutthroat trout *O. Clarki lewisi*, domestic Kamloops rainbow trout *O. Mykiss,* golden trout *O. Aquabonita*, and rear grayling *Thymallus arcticus* fry for stocking into high mountain lakes in regions 1, 2, 3B, 3M.

- Redistribute up to 80,000 catchable-size rainbow trout.

- Maintain and provide technical assistance for Payette Lake net pens.

- Maintain the statewide high mountain lakes stocking request database.

- Provide assistance to McCall sub-regional personnel as needed and available.

FISH PRODUCTION

Fish Lake Broodstock

Fish Lake is located approximately seven miles west of McCall. It is on Little Creek, a tributary to the Little Salmon River. The satellite facility is equipped with two 6-ft x 22-ft x 4-ft

concrete holding ponds, a 4-ft x 12-ft x 4-ft fish trap and a velocity barrier. Westslope cutthroat trout trapping and spawning operations typically extend from early April through May.

The fish lake trap operated from April 12 through May 19, 2000. A total of 142 westslope cutthroat trout were trapped. Of these, 88 were males (62.0%) and 54 were females (38.0%). Average total lengths for males and females were 314.8 mm and 314.3 mm, respectively.

Of the142 returning adults in 2000, 95 were marked with fin clips (66.9%). The most common mark observed was for 4-year old adipose clipped fish (75 fish or 78.9% of all marked fish). These (BY96) overwintered at McCall Hatchery and then were released in the spring of 1997. Replacement broodstock released after BY96 have not received any identifying fin clips. Fishery management personnel have attribute the primary cause for the collapse of this population to poor water quality factors. The fish trap at Fish Lake will be operated in 2001 to establish a count for spawning fish. Any fish returning will then be passed to spawn naturally. Westslope cutthroat eggs needed for mountain lake stocking will continue to be purchased until a captive brood stock is developed at Hayspur Hatchery.

Spawn taking operations took place from April 27 to May 19, 2000. A total of 47 females were spawned in 7 lots to produce a green egg take of 37,100 eggs (Appendix 1). Average fecundity was 789.4 eggs per female. The average eye-up for these eggs was 92.4% and resulted in 34,280 eyed-eggs. Of these approximately 30,500 were initially ponded and available for hatchery programs. Five returning females were released above the trap to spawn naturally. Following the completion of trapping operations, pickets in the trap/holding areas were removed and water flow through the trap maintained to allow for any potential fish migration.

On September 20, 2000 Fish Lake was stocked with 10,900 unmarked westslope cutthroat trout fry from this brood year. These fish were in excess of hatchery needs and averaged 310 fpp (53.3 mm TL).

High Mountain Lake Stocking

A total of 179 lakes were stocked with 184,870 fry in 2000 (Appendix 2). Of these, 165 lakes were stocked using fixed-wing aircraft at a cost of $8,592.00 in flight time. A total of 13 flights were completed during the period from August 8 to September 18, 2000. The average cost to stock a lake in this manner was $52.07. Volunteers stocked 14 lakes in the McCall area, saving the Department approximately $350 in comparable flight costs. Feed costs for resident fry reared at McCall Hatchery totaled $230.57.

The cost to stock individual lakes this year was higher due primarily to the expense of flying fish into the northern end of Region 1. The average cost to stock the requested lakes in Region 1 was $130.00 each. Fish size was a problem for the northern flights as altitude, winds, and fire conditions were unfavorable and delayed flights until mid September. At this time multiple bags were needed to stock each lake, which in turn required extra flights. An additional flight returning to 14 lakes was completed to ensure 100% of westslope cutthroat requests were met. In all, four flights were needed to stock the 30 lakes requested in Region 1.

The majority of mountain lake requests were me, with the exception of arctic grayling which were unavailable. The overall percentage of fry requests being met were: 98.8% westslope cutthroat, 97.2% sterile rainbow, and 95.8% golden trout. Means of stocking included volunteer backpacking, aerial plants, and truck plants.

Beginning on August 26th, the westslope cutthroat trout obtained from the Westslope Cutthroat Trout Company were treated with a 10-day medicated feed treatment of Oxytetracycline. Fish pathologists confirmed these fish were infected with bacterial coldwater disease (*Flexibacter psychrophilum*). Elevated mortalities being experienced subsided by the end of the treatment. No other groups of resident fry were affected by this outbreak of coldwater disease.

Additional fry stocked out in 2000 included 2,210 adipose clipped westslope cutthroat to Brundage Reservoir, and 10,900 westslope cutthroat to Fish Lake.

Catchable Redistribution

During the period of May 16 to August 16, 2000 a total of 74,460 catchable-size domestic Kamloops were stocked into 39 water bodies in the McCall vicinity. All of these fish were reared at Nampa Fish Hatchery (NFH) and then transferred to MFH. Transportation costs to bring catchables in from NFH totaled $3,035. Hatchery personnel drove approximately 3,400 miles on 74 stocking trips to complete requests and transfers, at an approximate cost of $3,155. This resulted in a combined average distribution cost of $83.13 for each 1,000 fish stocked.

McCall hatchery personnel assisted with the collection of 472 smallmouth bass captured in Hells Canyon by Trout Unlimited (TU) members and McCall sub-regional management. These fish were then transported and released into Little Payette Lake.

Payette Lake Net Pens

This was the tenth year for net pen production of trout in Payette Lake. The McCall Chapter of Trout Unlimited (TU) continues to provide the primary community support for this project on an annual basis. Trout Unlimited members organized a schedule for several local businesses to feed the fish in the nets daily. Once again TU sponsored two fishing clinics for area children and families to fish off the net pen docks. Enthusiastic beginning fishermen caught several large rainbows from previous net pen production. Many Northern pikeminnows, which congregate around the net pens, were also disposed of.

This year the City of McCall was able to secure a Fish America grant through Wildlife Rivers ($2,435). This money helped to pay for the replacement of two rearing nets, a gumball machine for fish food, and new rope handrails for the dock leading to the nets. These monies were supplemented with additional money provided by TU ($1,500). Vandalism damage to the gumball machines continues to be a problem at this unsecured site.

Two nets (20-ft x 20-ft x 30-ft) were used to rear 5,900 domestic Kamloops. These fish were placed into the nets on June 13, 2000. Average fish size at this time was 2.8 fish per pound (fpp) or 9.7 inches TL. Approximately 5,800 trout from the net pens were released on September 6, 2000. These fish had grown well and averaged 1.43 fpp or 12.1 inches TL. Rearing mortality was estimated at 100 fish. Total production from the net pens was 4,056 lbs (1,946 lbs gain). To accomplish this, a total of 2,800 lbs of feed was fed out resulting in a conversion of 1.44 (Appendix 3).

Total costs incurred as part of the net pen project was estimated at $6,655. Monies provided by TU and the Fish America grant to replace worn out items totaled $3,935. Community businesses and TU also contributed approximately $920 in donated labor. The cost estimate for MFH was $1,800, which included personnel costs for set-up, removal, clean up, and purchase of all feed used in 2000 (Appendix 4).

Hatchery/Program Improvements

A replacement 1-ton 4x4 pickup (new) was secured for use by the resident program as the primary means for stocking catchables. This ensures reliable transportation will be available in the future. Two new nets and a gumball feed dispenser were purchased by TU, with the aid of a Fish America grant, this year. The City of McCall also replaced the rope handrails leading to the net pens and placed additional floatation beneath the docks to help level the walking surface.

Public Relations

McCall Fish Hatchery staff assisted Trout Unlimited and Department personnel in transferring smallmouth bass from Hells Canyon Reservoir to Little Payette Lake. Two fish stocking presentations were made: one for approximately 60 outdoor school sixth graders on Lake Cascade and the other for 10 cub scouts at Tripod Reservoir. Hatchery personnel participated in one fishing clinic sponsored by Trout Unlimited on the Payette Lake net pen dock and assisted with Free Fishing Day activities held at Rowland Pond. McCall Fish Hatchery staff also assisted the MK Nature Center Historic Hatchery presentation, and gave numerous tours through the hatchery.

ACKNOWLEDGEMENTS

Accomplishments made through the resident program in 2000 would not have been possible without the support of the entire staff at McCall Summer Chinook Hatchery. I wish to thank Gene McPherson, MFH Fish Manager II, for his advice and assistance on various resident projects as well as for generously allowing anadromous funded personnel to work on resident projects. Individuals assisting on resident endeavors at MFH in 2000 included: Joel Patterson (MFH Fish Culturist) and seasonal temporaries Chris Schneider, Amanda Millington, Ryan Kinzer, Gary Duke, Will Ranstrom, Ted Inman, Jeff Thurston, and Scott Campbell.

APPENDICES

Appendix 1. Westslope cutthroat trout spawn take results, Fish Lake, McCall Hatchery, 2000.

Females Spawned	Green Eggs Taken	Percent Eye-up	Eyed Eggs Available	Average Fecundity
47	37,100	92.4	34,280	789.4

Appendix 2. Species stocked out, by region as part of the high mountain lake program, 2000.

	Westslope Cutthroat	Hayspur Rainbow Sterile (T9)	Golden Trout	All Species Stocked	Total Lakes Stocked
Panhandle	49,000	17,650	3,300	69,950	30
Clearwater	22,000	1,000		23,000	25
Southwest	12,000	12,000	1,275	25,275	33
McCall (3M)	31,200	16,110		47,310	66[a]
Magic Valley			1,690	1,690	3
Upper Snake			3,400	3,400	4
Salmon		10,350	3,895	14,245	18
TOTALS	**114,200**	**57,110**	**13,560**	**184,870**	**179[a]**

Note: No Grayling were available for stocking in 2000.

[a] Includes 14 lakes stocked by volunteers.

Appendix 3. Feed usage and conversion data, McCall Fish Hatchery, 2000.

Species	Stocked	Feed Used	Weight Gained	Conversion	Cost per lb Gain	Cost per 1000 fish	Total Feed Cost
Fry Redistribution							
Westslope Cutthroat (Fish Lake)	29,710	84.2	75.8	1.11	$ 1.13	$ 2.87	$ 85.35
Westslope Cutthroat (commercial)	97,600	70.6	61.0	1.16	$ 1.32	$ 0.82	$ 80.25
Hayspur Rainbow (T9)	57,110	57.5	52.7	1.09	$ 1.11	$ 1.02	$ 58.28
Golden Trout	13,560	6.6	5.2	1.27	$ 1.29	$ 0.49	$ 6.69
Total	**197,980**	**218.9**	**194.7**	**1.12**	**$ 1.18**	**$ 1.16**	**$ 230.57**
Note: Data includes all fry stocked.							
Payette Lake Net Pens							
Domestic Kamloops (BY99)	5,800	2,800	1,946	1.44	$ 0.38	$ 126.04	$ 731.08

Appendix 4. Total production and distribution at McCall Fish Hatchery, 2000.

Species	Eyed eggs/ fish received	Fish stocked out	Pounds gained	Cost per lb gained	Cost/ 1000 fish stock/ produced
High Mountain Lake Program					
Westslope Cutthroat (Fish Lake)	34,280	16,600	38.6		
Westslope Cutthroat (Commercial)	130,600	97,600	61.0		
Hayspur Rainbow (T9)	97,280	57,110	52.7		
Golden Trout	17,640	13,560	5.2		
Subtotal	279,800	184,870[a]	157.5	$ 54.55	$ 46.48
Note: Cost based on flight time expenses of $8,592. [a] Includes fry stocked by volunteers.					
Payette Lake Net Pen Program					
Domestic Kamloops (BY99)	(5,900)	(5,800)	1,946	$ 3.42	$ 1,147.41
Subtotal	(5,900)	(5,800)	1,946	$ 3.42	$ 1,147.41
Note: Cost based on program expenditures and contributions of $6,655 (IDFG $1,800; Trout Unlimited and Volunteers $ 4,855).					
Catchable Trout Redistribution (including free fishing day transfers and net pen loading above)					
Domestic Kamloops (BY99)	76,260	74,460	Catchables are not fed at MFH		$ 83.13
Subtotal	76,260	74,460			$ 83.13
Note: Cost based on Department transport expenses of $ 6,190 (McCall Hatchery $ 3,155; Nampa Hatchery $3,035).					
Additional Fry Redistribution					
Westslope Cutthroat (Fish Lake)	Included in Mountain Lake Program above	13,110	37.2	$ 1.88	$ 5.34
Subtotal		13,110	37.2	$ 1.88	$ 5.34
Note: Cost based on partitioned feed expenses and stocking transportation costs of $ 70.					
TOTAL	**356,060**	**272,440**	**2,140.7**	**$ 24.03**	**$ 188.85**
Note: Cost based on averaged McCall Fish Hatchery resident budget of $ 51,450.					

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

MULLAN FISH HATCHERY

Mary Van Broeke, Bio-Aide

INTRODUCTION

The Mullan Fish Hatchery (MUFH) is a resident species redistribution station located four miles east of Mullan, Idaho. The Shoshone County Sportsmen's Association owns the MUFH. Shoshone County provides funds to maintain the physical plant. The Idaho Department of Fish and Game (Department) provides funds for personnel costs, production costs, and equipment, through fishing and hunting license fee revenues. The facility operates as a satellite of the Clark Fork Fish Hatchery (CFFH), with one temporary employee on station year-round.

The hatchery receives water from the South Fork of the Coeur d'Alene River and the Little North Fork of the Coeur d'Alene River. Two concrete raceways (6-ft x 65-ft each), one concrete raceway (12-ft x 65-ft), and three dirt ponds (30-ft x 100-ft each), are used to hold fish prior to stocking into the Coeur d'Alene and St. Joe river drainages. One of the dirt ponds has been developed as a show pond complete with visitor's access deck, information board, and a feed dispenser.

The MUFH plays a vital role in supporting the put-and-take rainbow trout *Oncorhynchus mykiss* fishery. Daily trips are made from May to September from this location onto the Coeur d'Alene and St. Joe rivers, providing the frequent stocking service needed to support such a fishery. The close proximity to a Shoshone County park encourages the highest visitor attendance rate of any hatchery in the Panhandle Region.

HATCHERY IMPROVEMENTS

Hatchery improvements during 2000 included:

- Painting the main hatchery building and shop.
- The Shoshone county work crew dug out the domestic water reservoir and repaired an area below the South Fork dam where the main pipe to the hatchery was washing out.
- Pond #1 main outlet screen was replaced and silt removed from the pond.
- The Shoshone County Sportsmen's Association had an information sign built by the Mullan High School shop class.

FISH STOCKED OR TRANSFERRED

A total of 55,190 (16,923 lbs) rainbow trout 9 inches long were released into the Coeur d'Alene, St. Joe, and St. Maries river drainages from May to September to support a put-and-take fishery. All stocking sites with free flowing water received sterile rainbow trout. All trout released from the MUFH were reared at the CFFH. Fish were reared to full release size and then transported from Clark Fork to Mullan for redistribution. The hatchery worker loaded the fish into a 500-gal pickup truck-mounted tank and delivered them to hundreds of miles of streams, and numerous lakes and ponds. The distribution schedule requires eight to 10-hour

trips, four to five days each week during the summer season. While lake stocking is usually accomplished with single large releases, river stocking is much more labor intensive. Even relatively small numbers of fish require multiple stops to distribute the fish effectively for sportsmen's access.

PUBLIC RELATIONS

The MUFH is located adjacent to a popular Shoshone County "day use" park. As a direct result, the hatchery receives a much higher visitor level than would be expected in this remote location. The hatchery serves the highest number of visitors of any hatchery in the Panhandle Region, with over 9,000 people touring the grounds in 2000. The hatchery also hosted the Chrysler/Jeep Jamboree and the Silver Valley Good Samaritan RV Rally. People from across the nation attended these functions. Many groups of local school children also toured the hatchery.

The hatchery maintains a covered visitor information center with a map of stocking areas and information about the special harvest regulations in the Coeur d'Alene River and St. Joe River drainages.

On June 10, one of the dirt rearing ponds at the hatchery was stocked with rainbow trout to provide fishing for a Free Fishing Day Clinic. Personnel from the Panhandle Region, and the Shoshone County Sportsmen's Association provided training and advice to more than 120 participants that day, with every angler catching their 2-fish limit of rainbow trout. The location is particularly beneficial in providing access for persons with limited mobility. As usual, the Fishing Clinic received good reviews in the local newspaper and boosted the Department's image in the Silver Valley.

SPECIAL PROJECTS

Water Quality Studies

For the fifth year in a row the MUFH assisted in a rearing and survival assessment for westslope cutthroat trout *O. clarki lewisi* and rainbow trout in South Fork Coeur d'Alene River water. This work is part of a major research project evaluating toxicity and water quality degradation following mining activity in the Silver Valley. Personnel from Environmental Services for Industry and Government (EVS) conducted the study. Fish for the study were obtained from wild, adult cutthroat caught from the Coeur d'Alene River by local sportsmen. The fish were spawned, the eggs were incubated, and the resulting fry were used in the study. The study will be completed in the summer of 2001.

IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

NAMPA FISH HATCHERY

Rick Alsager, Fish Hatchery Manager II
Dan Baker, Assistant Fish Hatchery Manager
Bob Turik, Fish Culturist

INTRODUCTION

Nampa Fish Hatchery (NFH) is a resident trout rearing facility located one mile south of Nampa, Idaho. The NFH water is supplied by eight pump assisted artesian wells. A maximum flow of 40 cubic feet per second (cfs) of 59^{o}F water is available for fish production. Built in 1975 and purchased by the Idaho Department of Fish and Game (Department) in 1982, fish rearing facilities consist of a hatchery building/dorm containing 4 early rearing vats and a feed storage room. Outside rearing tanks including 16 fry raceways, 3 fingerling/broodstock raceways, and 10 production raceways. Sixteen upwelling incubators are available for use in the fry raceways for eyed-egg incubation. A settling pond treats flows from the rearing units before discharge into Wilson Springs Ponds and Wilson Springs Drain.

FISH PRODUCTION

The NFH produced 1,965,198 fish weighing 269,173 lbs during the 2000 fish year. Fish transferred to other hatcheries are included in the total number and pounds produced. Kamloops and rainbow trout *Oncorhynchus mykiss* comprised 87% of the fish stocked or transferred from NFH. In addition, Lahontan cutthroat trout *O. clarki henshawi* and Fall Chinook salmon *O. tshawytscha* were produced at NFH during 2000 (Appendix 1). Another 1,000 fish weighing 150 lbs were produced at NFH and given to schools for dissection, and to department personnel for various research programs. These fish were not included in overall production numbers.

The total number of fry (Appendix 2), fingerlings (Appendix 3), and catchables (Appendix 4), stocked or transferred by NFH are listed by species/strain in each table. A total of 2,844,625 eyed-eggs were received during the 2000 fish year (Appendix 5).

FISH STOCKED/TRANSFERRED

The NFH personnel stocked or transferred 2,036,964 fish weighing 312,697.95 lbs, during the 2000 fish year. A total of 460 stocking trips were made by NFH during 2000. The Southwest Region received 390,771 catchable trout weighing 136,752 lbs.

A total of 249,130 catchable trout (86,260 lbs) were transferred to other hatcheries throughout the state (Appendix 4). One group of large catchables (broodstock) was stocked in Panhandle Region waters. These were feral fish from the settling pond and tailrace that were trapped in an empty raceway. They were a mixture of sizes and strains of rainbow trout.

FISH TRANSPORTATION

Fish transport operators stationed at NFH stocked waters in all regions throughout the state of Idaho and transferred fish to and from 20 different state and national fish hatcheries.

They transferred endangered chinook salmon *O. tshawytscha* from Eagle Fish Hatchery to Manchester Fish Hatchery (National Marine Fisheries Service [NMFS] operated at Port Orchard, WA.). A trip was also made to Wyoming (Clark Fork State Fish Hatchery) to pick up Brown trout *Salmo trutta* fingerlings, which were stocked in Horsethief Reservoir (14,860 fish, 1,486 lbs). Channel catfish *Ictalurus punctatus* fingerlings were purchased from Fish Breeders of Idaho; a private hatchery located near Buhl, Idaho. These fingerlings were stocked in the Panhandle Region (25,900 fish, 4,106.6 lbs), Clearwater Region (3,400 fish, 522 lbs), and Southwest Region (1,000 fish, 153 lbs). The transport operators stationed at NFH made 135 trips totaling 53,000 miles during 2000.

The NFH transport operators stocked rainbow trout fingerlings from Lyons Ferry Fish Hatchery (202,266 fish, 4,932 lbs) into Clearwater Region waters. They also stocked chinook salmon and B-run steelhead smolts from Clearwater Fish Hatchery and assisted with the transportation of chinook salmon smolts from McCall Fish Hatchery. This fall, our drivers assisted in transporting and stocking surplus A-run adult steelhead from Oxbow Fish Hatchery; 750 steelhead were released into the Boise River, 50 steelhead were released into the Payette River and 800 steelhead were transported and released in the Little Salmon River.

NFH transport operators also assisted the engineering department with personnel moves. They moved six Department personnel on four trips. Dick Bittick also assisted Howard Brown with preparing anadromous trucks for hauling smolts.

LAHONTAN CUTTHROAT TROUT

During the 2000 fish year, NFH stocked 218,909 Lahontan cutthroat trout into lakes and reservoirs located in the Southwest and Upper Snake regions. All Lahontan cutthroat eggs were received from Omak Fish Hatchery in Washington. Southwest Region fish were stocked as fry (Appendix 2) and fingerlings (Appendix 3). Upper Snake Region fish were all stocked as fingerlings (Appendix 3). Estimated survival from eyed-egg to stocking was 56.97%. Due to past shipping and handling problems, NFH personnel picked up cutthroat eyed-eggs from Omak personnel at Pendleton, OR.

FALL CHINOOK SALMON

Fall chinook salmon were received as fry from Cabinet Gorge Fish Hatchery (CGFH). Cabinet Gorge received eyed-eggs from Big Creek Hatchery in Oregon. The fall chinook were hatched and started on feed in the colder water at CGFH before being transferred to Nampa Hatchery. A total of 36,900 fry weighing 46 lbs were transferred to NFH to be reared on warmer water. The fall chinook were stocked in Coeur D'Alene Lake and Lucky Peak Reservoir as pre-smolts (Appendix 3).

SPECIAL STUDIES

The NFH assisted resident research biologists with a hatchery study. Doug Megargle is heading this project, which is in the second year of his study. The study is set up to compare tag returns of catchable trout from three different hatcheries: Nampa, Hagerman, and American Falls hatcheries. Doug will compare fish culture practices to determine which practices can be improved or changed to increase catchable trout return-to-creel. Results from this year and further information can be obtained from Doug Megargle at the Magic Valley Regional office.

FISH FEED

A total of 281,264 lbs of feed was fed during 2000 at a cost of $81,697 (Appendix 6). The average cost per pound of feed was 29.05 cents. Rangen Inc. made up 98.11% of the feed purchased by weight (Appendix 6). The overall feed conversion was 1.04 pounds of feed fed to produce one pound of fish.

Feeding practices have changed slightly over the previous years. Moore-Clark feed is now used for starting fry on feed. Moore-Clark feed outperformed Rangen and Bio-Oregon in a feed study completed during 1999. Rangen continues to carry the feed contract and is used throughout the remainder of the rearing cycle. Bio-Oregon feed is used throughout the rearing cycle of the Lahontan cutthroat trout. The cutthroat have performed better on the semi-moist diet provided in the Bio-Oregon feeds.

FISH SPAWNING

Early Kokanee

The NFH continues to operate the early kokanee salmon *O. nerka kennerlyi* trapping and spawning project. Numbers of kokanee at Deadwood Reservoir were lower than expected. The fish size was larger than last year, which also increased fecundity. Egg-take goals for 2000 were 1.75 million green eggs for Mackay Fish Hatchery (MFH), and 1.5 million for Dworshak Reservoir. These kokanee eggs were to be shipped to CGFH.

The kokanee population was lower than the previous years, but has rebounded slightly from the 1996 low. The main weir across the Deadwood River was installed on August 10, after the water level had dropped to below the mouth of Wild Buck Creek. The kokanee weir structures were installed on Wild Buck, Trail, and Basin creeks on August 11 and 12. Trapping and spawning ran smoothly throughout the run. Egg take goals were not met for MFH or Dworshak Reservoir, due to low number of kokanee in the run. A total of 931 females were spawned achieving a total egg take of 848,733 green eggs, average fecundity was 912 eggs per female.

In an effort to eliminate some of the problems that have occurred over the previous years, more signs were installed marking boundaries around weirs and explaining Department Kokanee Project goals. Fewer problems were encountered this season, partly due to a lower number of kokanee in the river. Matt Erickson also took an active roll in enforcement operations on the river. The weirs on Deadwood River were checked numerous times throughout the day. The weir across Trail Creek was checked every other day.

The staff at Deadwood Reservoir continued assisting the regional fish manager with removing the gabion across the Deadwood River. The gabion no longer blocks fish movement up the Deadwood River. Approximately 500 pair of adult kokanee were released above each weir to provide natural production. The Morrison Knudsen Nature Center received 200 adult kokanee for viewing at the Nature Centers ponds. Salmon and Steelhead days received 100 pair of spawned-out kokanee for educational purposes.

All fish were spawned at the trap site. A green egg yield of 848,734 eggs was taken from 931 females for a fecundity rate of 911 eggs/female (Appendix 8). Average total length of kokanee females was 413 mm, with males averaging 426 mm (Appendix 9).

Eggs were shipped to MFH via fixed-wing aircraft. Shipping techniques were similar to those used during previous years. The Department contracted the flying service with McCall Air Taxi.

HATCHERY IMPROVEMENTS

Several important improvements were implemented at NFH during 2000:

- A new commercial grade Dixon lawnmower was purchased.
- The vinyl flooring in Residences #1, #2, & #3 was replaced with wood flooring.
- The ceiling in Residence #1 was painted.

Hatchery improvements scheduled for 2000 include:

- Install new siding on Residences #2 and #3.
- Shingle or install new roof on residence #3.
- Finish visitor information center.
- Replace wood headrace covers with 1/8 inch steel covers.
- Landscape around hatchery office, entrance, and residence #3.

PUBLIC RELATIONS

As in past years, NFH was a focal point for many visitors, tours, and special groups. In 2000, an estimated 5,000 tourists visited the NFH. Most visits came through the late spring and summer months; although with year-round schooling, tours were scheduled every month except January. A total of 62 guided tours were given to area school, church, and Boy Scout groups. The NFH is becoming more involved in the job shadow program; during 2000 two students participated in one- or two-day job shadow programs. Two slide show presentations were given to area schools and churches. The disabled veterans were allowed to fish the settling pond five times during the summer months. Five other disabled groups from the Nampa area were allowed to fish the settling pond through the summer. The settling pond was also opened to fishing on Free Fishing Day. The NFH, Nampa Parks and Recreation Dept., SW Region personnel, and two reservists, hosted the Free Fishing Day clinic; which saw 1,000 visitors/fishermen, with an estimated 1,500 fish caught. The largest fish caught was an 8-pound rainbow trout and several more weighed over five pounds. Once again, Free Fishing Day at NFH was a big success and will be continued in the future. We felt the “kids only” session from 8:00 a.m. to noon was very popular and successful. Assistance on fish culture programs was provided to many area schools. Fry and fingerlings were provided for living streams, and catchables were provided for dissection in several classes.

ACKNOWLEDGEMENTS

The NFH staff for 2000 included Rick Alsager, Fish Hatchery Manager II; Dan Baker, Assistant Fish Hatchery Manager; Bob Turik, Fish Culturist; and Gary Ady and Dick Bittick, Fish Transport Operators. Bio-aides for 2000 included: Chad Knee, Greg Kollmann, Randy Hutzenbiler and Ken Felty. Chuck Kiester assisted with the Kokanee spawning operation. Six area students assisted with fin clipping projects during 2000. Four high school students assisted hatchery personnel through a work-study program. Volunteers have also helped on a number of projects throughout the year, donating over 300 hours of time.

Appendix 1. Fish requested and produced at Nampa Fish Hatchery, 2000.

Species/Strain	Size	Production goal	Actual production	% of goal achieved
Triploid rainbow trout (T9)	1-3 inches	20,000	20,060	100.30%
Triploid Kamloops trout (KT)	1-3 inches	0	87,687	NA
Lahontan cutthroat trout (C6)	1-3 inches	103,000	146,909	142.63%
Lahontan cutthroat trout (C6)	3-5 inches	50,000	72,000	144.00%
Fall Chinook salmon (FC)	3-5 inches	38,620	39,639	102.64%
Triploid Kamloops trout (TT)	3-5 inches	200,000	200,880	100.44%
[b]Rainbow trout (R1)	3-5 inches	613,000	559,150	91.22%
Triploid rainbow trout (T9)	3-5 inches	105,000	73,171	69.69%
Kamloops trout (KS)	8-12 inches	588,000	616,999	104.93%
Rainbow trout (R9)	8-12 inches	70,000	84,685	120.98%
Triploid rainbow trout (T9)	8-12 inches	150,000	132,730	88.49%
Totals		**1,937,620**	**2,033,910**	**104.97%**

Appendix 2. Fry production at Nampa Fish Hatchery, 2000

Source and Date Received	Number Received	Yield Number	Yield Pounds	% Survival Egg to plant	Destination
Hayspur 3/00	28,000	20,060	170.00	71.6%	Southwest Region
Omak 5/00	250,000	146,909	150.75	58.8%	Southwest Region
Hayspur 10/00	120,000	87,687	74.50	73.1%	Southwest Region
	398,000	**254,656**	**395.25**	**64.0%**	

Appendix 3. Fingerlings stocked and transferred by Nampa Fish Hatchery, 2000.

Species/strain	Source	Date	Number Received	Yield Number	Yield Pounds	% Survival egg to plant	Destination
Fall Chinook salmon	Hayspur	1/00	40,000	39,639	1,825	99.10%	[a]Panhandle Region Southwest Region
Rainbow trout	Hayspur	12/99	144,630	101,114	1,650	69.91%	Magic Valley Region
Rainbow trout	Hayspur	12/99	299,060	224,970	3,550	75.23%	Magic Valley Region Southwest Region
Rainbow trout	Hayspur	1/00	201,245	135,108	1,650	67.14%	Southwest Region
Rainbow trout/Kamloops trout	Hayspur	3/00	41,950	39,588	3,550	94.37%	Magic Valley Region
Triploid rainbow trout	Hayspur	3/00 & 5/00	129,300	83,182	544	64.33%	Southwest Region
Lahontan cutthroat trout	Omak	5/00	134,260	72,000	1,000	53.63%	Southwest Region Upper Snake Region
Kamloops trout	Hayspur	5/00	75,800	51,359	1,595	67.76%	Clearwater Region
Kamloops x Steelhead trout	Trout Lodge	6/00	260,600	200,880	2,480	77.05%	Southeast Region
Totals			**1,326,945**	**947,840**	**17,844**	**71.43%**	

Appendix 4. Catchables stocked and transferred by Nampa Fish Hatchery, 2000.

Species/strain	Source	Date	Number received	Yield number	Yield pounds	% Survival egg to plant	Destination
[a]Kamloops trout	Troutlodge	9/98	25,422	18,320	10,895	72.1%	Southwest Region
triploid rainbow trout	Hayspur	4/99	267,065	132,732	44,665	49.7%	C Reg
Kamloops trout	Troutlodge	6/99-9/99	726,176	596,337	204,943	82.1%	Southwest Region
							Transfer to McCall
							Transfer to Sawtooth
							Transfer to Clearwater
							Panhandle Region
							Transfer to Hayspur
rainbow trout	Hayspur	5/99 & 10/99	143,690	75,235	24,420	52.4%	Transfer to Sawtooth
Kamloops trout	Hayspur	3/98	15,000	11,970	4,250	79.8%	Southwest Region
Totals			**1,177,353**	**834,594**	**289,173**	**70.9%**	

[a]Production fish carried over from 1999.

Appendix 5. Eyed-eggs received at Nampa Fish Hatchery, January 1 to December 31, 2000.

Date received	Species/ strain	Source	Number	Destination	Expected yield	Cost/1,000 fish
1/10/00	rainbow trout	Hayspur	180,650	SW Reg	135,000	NC
1/12/00	rainbow trout	Hayspur	20,595	SW Reg	15,000	NC
2/23/00	triploid rainbow trout	Hayspur	13,000	SW Reg	8,000	NC
2/29/00	K1/R9/T9	Hayspur	29,355	SW Reg	20,000	NC
3/6/00	Kamloops trout	Hayspur	12,235	SW Reg	8,000	NC
3/13/00	triploid rainbow trout	Hayspur	67,885	SW Reg	50,000	NC
5/1/00	Kamloops trout	Hayspur	75,800	C Reg	50,000	NC
5/1/00	triploid rainbow trout	Hayspur	36,800	SFH	25,000	NC
5/8/00	triploid rainbow trout	Hayspur	26,675	SFH	15,000	NC
5/15/00	triploid rainbow trout	Hayspur	99,070	MV Reg	65,000	NC
5/4/00	Lahotan cutthroat trout	Omak	384,260	SW Reg & US Reg	153,000	NC
6/22/00	triploid Kamloops trout	Troutlodge	541,150	SW Reg, HSFH, MCFH P Reg & C Reg	400,000	$15.00
6/29/00	triploid Kamloops trout	Troutlodge	414,975	SW Reg, HSFH, MCFH P Reg & C Reg	300,000	$25.00
9/14/00	triploid Kamloops trout	Troutlodge	212,865	SW Reg	150,000	$25.00
10/18/00	triploid Kamloops trout	Hayspur	241,000	SW Reg	150,000	NC
10/30/00	triploid rainbow trout	Hayspur	52,150	SFH	35,000	NC
11/6/00	triploid rainbow trout	Hayspur	52,000	SFH	35,000	NC
12/11/00	triploid Kamloops trout	Hayspur	159,360	SW Reg	100,000	NC
12/11/00	triploid rainbow trout	Hayspur	224,800	SW Reg	150,000	NC

Destination Key	
C Reg	Clearwater Region
CFH	Clearwater Fish Hatchery
HSFH	Hayspur Fish Hatchery
MV Reg	Magic Valley Region
MCFH	McCall Fish Hatchery
P Reg	Panhandle Region
SFH	Sawtooth Fish Hatchery

Appendix 6. Nampa Fish Hatchery feed costs, 2000.

Supplier/Source	Size/Type	# Boxes/Bags	Pounds	Price/lb	Feed charge
BioOregon					
soft-moist	starter #1	1 box	44	1.05	$46.20
soft-moist	starter #2	3 boxes	132	1.05	$138.60
soft-moist	starter #3	4 boxes	176	1.05	$184.80
soft-moist	grower 1.0	4 boxes	176	0.79	$139.74
soft-moist	grower 1.3	8 boxes	352	0.78	$272.80
soft-moist	grower 1.5	23 boxes	1,012	0.73	$738.56
soft-moist	grower 2.0	18 boxes	792	0.68	$535.39
soft-moist	grower 2.5	1 box	44	0.65	$28.73
		Totals	**2,728**		**$2,084.83**
Rangen					
Dry Crumble	Swimup	1 sack	50	0.45	$22.43
Dry Crumble	Starter #1	18 sacks	900	0.43	$390.35
Dry Crumble	Starter #2	63 sacks	3,150	0.43	$1,346.28
Dry Crumble	Starter #3	297 sacks	14,850	0.29	$4,250.18
450 floating	1/16-in pellet	144 sacks	7,200	0.38	$2,758.40
450 floating	3/32-in pellet	165 sacks	8,250	0.30	$2,484.40
450 floating	1/8-in. pellet	165 sacks	8,250	0.29	$2,358.30
450 floating	1/16-in pellet	bulk	4,790	0.36	$1,741.64
450 floating	3/32-in pellet	bulk	22,670	0.25	$5,692.44
450 floating	1/8-in pellet	bulk	203,630	0.27	$55,343.27
Dry crumble med	Starter #3	5 sacks	250	0.56	$140.55
Dry crumble med	Starter #4	30 sacks	1,500	0.57	$854.55
450 floating med	3/32-in pellet	10 sacks	500	0.47	$236.15
		Totals	**275,940**		**$77,618.93**
Moore-Clark					
Nutra Plus	#0	13 sacks	616	1.05	$646.80
	1.5mm	36 sacks	1,980	0.68	$1,346.40
		Totals	**2,596**		**$1,993.20**

Appendix 7. Total net fish production at Nampa Fish Hatchery, 1994 through 2000.

	Put-and-Take		Put-grow-and-take		Total	Total	Feed		Feed
Year	Number	Pounds	Number	Pounds	Number	Pounds	Pounds	Costs	Conversion
1994	308,023	146,978	793,065	55,014	1,101,088	201,992	220,544	$72,340	1.09
1995	567,147	193,309	783,722	42,336	1,350,869	235,645	261,589	$76,793	1.11
1996	694,659	212,011	950,412	34,271	1,645,071	246,282	262,902	$91,893	1.07
1997	556,718	188,208	693,859	19,006	1,250,577	207,214	240,140	$94,502	1.12
1998	692,706	228,006 #	2,172,659	22,901	2,865,363	250,907	267,782	$96,338	1.07
1999	1,077,110	336,841 #	348,962	26,677	1,426,072	363,518	345,288	$112,003	0.95
2000	864,603	250,976	1,100,595	18,197	1,965,198	269,173	281,264	$81,862	1.04

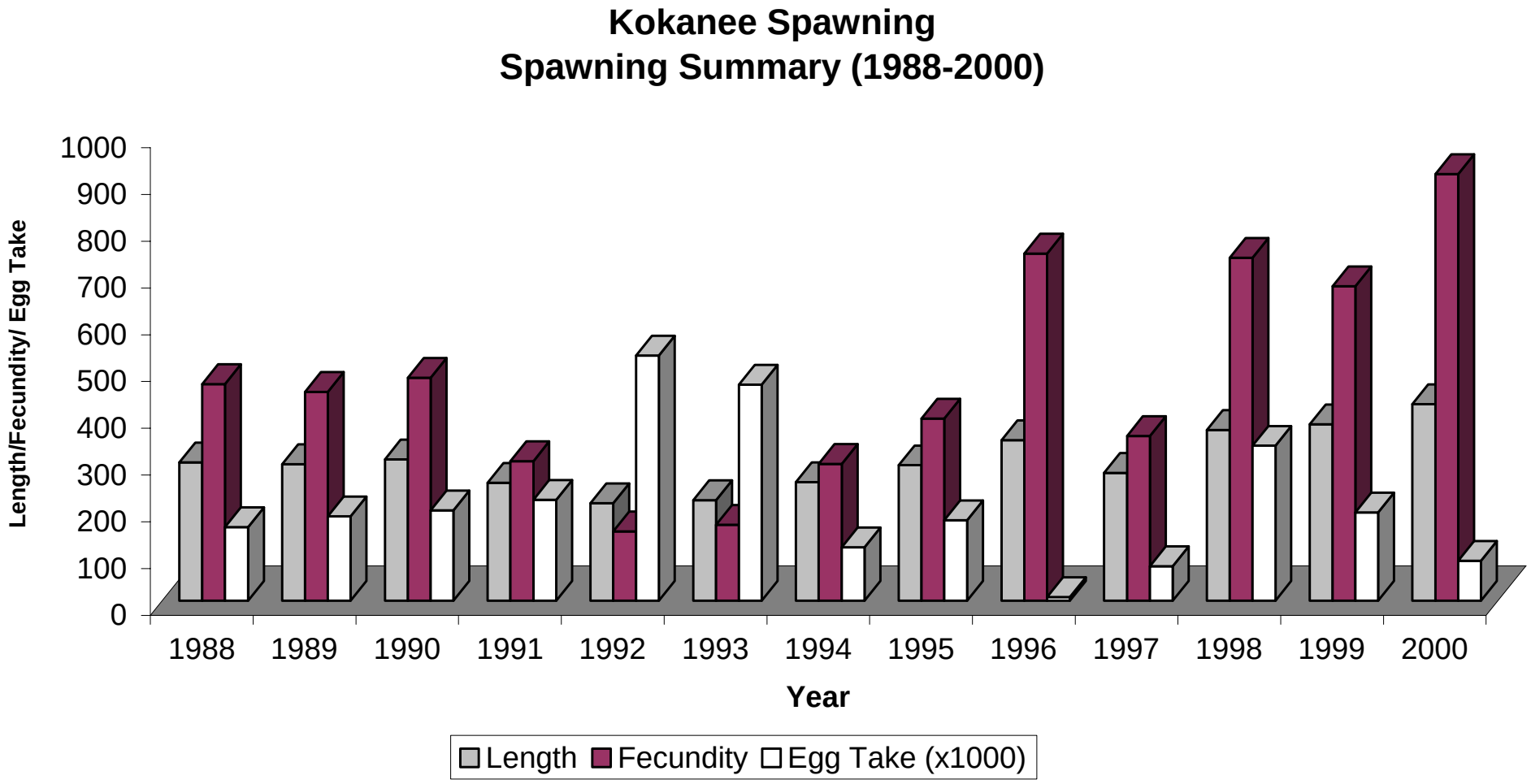
Appendix 8. Total cost of net fish production at Nampa Fish Hatchery, 1994 through 2000.

	Total cost through grow - out				Mean	Total cost through stocking			
Year	Total Cost	Cost/1000 Fish	Cost/ Pound	Cost/ Inch	Length in inches	Total Cost	Cost/1000 Fish	Cost/ Pound	Cost/ Inch
1994	$258,010	$234.32	$1.28	$0.029	8.06	$291,650	$264.87	$1.44	$0.028
1995	$271,156	$200.77	$1.15	$0.033	7.93	$304,695	$225.30	$1.29	$0.037
1996	$274,072	$166.60	$1.11	$0.027	7.50	$310,851	$188.96	$1.26	$0.031
1997	$308,979	$247.07	$1.49	$0.043	7.79	$342,063	$273.52	$1.65	$0.048
1998	$279,045	$97.39	$1.11	$0.023	7.30	$329,161	$114.88	$1.31	$0.027
1999	$363,623	$255.00	$1.00	$0.025	10.12	$428,624	$300.58	$1.18	$0.030
2000	$353,747	$180.02	$1.31	$0.032	5.59	$411,497	$209.41	$1.53	$0.037

Appendix 9. Kokanee egg-take at Deadwood Reservoir, Nampa Fish Hatchery, 2000.

Lot Number	Spawn date	Female spawned	Green eggs	Eyed Eggs	% eye-up
Mackay					
1	8/24/00	433	373,753	259,977	69.56%
2	8/29/00	324	318,000	237,222	74.60%
3	9/1/00	174	156,981	130,682	83.25%
	Total:	**931**	**848,734**	**627,881**	**73.98%**

Appendix 10. Kokanee spawning length, fecundity, egg-take (x1000), Nampa Fish Hatchery, 1988 – 2000.



IDAHO DEPARTMENT OF FISH AND GAME

2000 ANNUAL RESIDENT REPORT

SAWTOOTH FISH HATCHERY

Jeffrey D. Seggerman, Fish Culturist

INTRODUCTION

Sawtooth Fish Hatchery (SFH) is a US Fish and Wildlife Service (USFWS) Lower Snake River Compensation Plan (LSRCP) hatchery which has been in operation since 1985. The Idaho Fish and Game Department (Department) operates this facility. The primary goal of SFH is to trap, spawn, rear, and release spring chinook salmon *Oncorhynchus tshawytscha*. Adult steelhead are also trapped and spawned, with the eyed eggs being sent to other hatcheries for hatching and rearing. In 1990, a program to stock rainbow trout *Oncorhynchus mykiss* into surrounding area waters for improved angling opportunities began. In 1996, using fixed-wind aircraft, SFH personnel began stocking high mountain lakes with westslope cutthroat trout *Oncorhynchus clarki lewisi*.

FISH STOCKING

Sawtooth Fish Hatchery met its stocking request for 2000. In addition to the stocking request, SFH personnel stocked 7,500 extra fish into Stanley Lake, 200 extra fish into Squaw Pond, 1,250 fish into the Kid's Pond at SFH, and 100 fish into Salmon's Kids Pond (Appendix 1). Grouse Lake was canceled from the 2000 request at the recommendation of the Salmon Region Enforcement due to elevated water temperatures.

Nampa Fish Hatchery (NFH) supplied SFH with rainbow trout (K1 and R9 strains) for stocking. A total of 84,687 fish (75,237 R9s and 9,450 K1s) were received at SFH on two shipping days in May and June of 2000. Based on 34 sample counts and 95 fish plants, SFH personnel stocked a total of 87,165 fish (9,450 K1s and 77,715 R9s) in lakes and streams in the area. In addition to what was stocked, SFH removed 1,063 fish as mortality, (1.0%) mortality, throughout the course of the summer.

National Marine Fisheries Service (NMFS) permit #1188, which expires Dec 31, 2004, replaced permit #908 for resident rainbow trout releases in anadromous waters in the Salmon River drainage. Permit #1188 dictates hatchery-reared rainbow trout to be released in rivers, streams, and lakes with ESA-listed fish should not have an average size greater than 250 mm and no individual fish exceeding 300 mm in total length. The 250 mm size restriction would include fish planted in the Salmon River, Valley Creek, Yankee Fork Dredge Ponds, Alturas Lake, Pettit Lake, and Perkins Lake. Based on 62 fish plants to the above-mentioned streams and lakes, fish averaged 3.1 fish per lb (fpp) and 9.30 inches (236 mm) in total length. The permit also dictates fish in the upper Salmon River cannot be stocked until after June 15 and should have an adipose fin clip. Only fish with the adipose fin clip may be kept, thereby protecting wild rainbow trout and natural steelhead smolts. All the R9 strain rainbows received at SFH in 2000 were adipose clipped by personnel at NFH and then delivered to SFH 21 days later to allow for withdrawal of MS-222 so fish would be safe for human consumption.

The catchable rainbow trout were fed a maintenance diet throughout the summer. Fish feed was purchased from Rangen Inc. A total of 1,892 lbs of 3/32 soft moist Salmon Grower and 2,250 lbs of Rangen 1/8 inch extruded pellets were fed throughout the course of the summer. The soft-moist Salmon grower was left over from steelhead smolt acclimation. It is

valued at $1,666.85. The Rangen 1/8 inch extruded pellets cost $584.10. Total cost for fish feed for BY2000 catchable rainbow trout was $2,250.95.

For the second year in a row fish were stocked in Blue Mountain Meadow Pond located on the Challis Golf Course in Challis, Idaho. The pond was built as a cooperative effort between the Department and the City of Challis as a children's fishing pond. Sawtooth Fish Hatchery personnel stocked 1,050 fish over four months into Blue Mountain Meadow Pond.

Weekly notices informing the public of the whereabouts of the latest stocking locations are distributed to local businesses and are posted at SFH. A repeating message containing stocking information and current news about SFH can be heard over the local radio transmitter. Stocking information is available by dialing 1-800-ASK-FISH. The SFH web page is complete and can be accessed through the hatchery's web site.

The "Fishing Sawtooth Valley" brochure is distributed at the SFH visitor center and surrounding businesses to provide information about where to catch fish in the area, it also contains color pictures to educate the public about protected species such as bull trout. A short narrative describing the plight of anadromous fish is included. The back of the brochure has a map indicating where SFH stocks fish. This helpful brochure serves approximately one million visitors who visit the Sawtooth National Recreation Area each year.

Sawtooth Fish Hatchery sponsored another Kid's Fishing Day at the Sawtooth Display Pond on Free Fishing Day, June 10, 2000. Due to the inclement weather only 43 kids tried their luck. The fishing was slow but the kids had fun, and most caught fish. Fishing poles, bait, and lures were supplied by Salmon Region I & E. The Free Fishing Day account was used to provide snacks and drinks for the kids while they fished. Sawtooth hatchery staff helping out included Kurt Schilling, Jeff Seggerman, Lisa Ashby, John Graves, and Cassie Rohrbacher. Gary Gadwa provided assistance from the Salmon Region. Special thanks to Vicky Runnoe for providing funds from the Free Fishing Day account and to Tom Curet for assuring the arrival of the Region fishing poles.

Mountain Lake Stocking

Sawtooth Hatchery personnel stocked high mountain lakes in the Salmon Region from a fixed-wing aircraft in 2000. A total of 73 lakes were stocked with 28,050 Westslope cutthroat trout. Cost of stocking with four flights by McCall Air Taxi was $1,728.00, or $23.67 per lake. Cutthroat numbers were less then the original request due to changes requested by Salmon Region fisheries biologists that removed some of the usual lakes.

PLANS FOR 2001

A new hatchery database using Access will be utilized in 2001, making it easier to enter stocking records into the computer.

The SFH plans to participate in the Free Fishing Day program again.

ACKNOWLEDGEMENTS

Sawtooth Fish Hatchery would like to thank Rick Alsager and the Nampa Fish Hatchery crew for their cooperation in making 2000 successful. Special thanks go to Dick Bittick and Gary Ady for transporting fish from Nampa Fish Hatchery.

APPENDICES

Appendix 1. Planting sites and numbers of catchable rainbow trout stocked in the Salmon Region by Sawtooth Fish Hatchery from May through September 2000.

Salmon River Stockings

Site	Number
Little Bayhorse Lake	2,000
Kelly Creek Pond	1,200
Stanley Lake	21,500
Pettit Lake	3,000
Perkins Lake	2,300
Alturas Lake	8,165
Salmon River	37,500
Yankee Fork Dredge Ponds	4,000
Valley Creek	4,000
Salmon Kid's Pond	100
Blue Mountain Meadow Pond	1,050
Squaw Creek Pond	1,100
Sawtooth Hatchery Kid's Pond	1,250
Totals	**87,165**

Appendix 2. Planting sites and numbers of cutthroat fry stocked in the high mountain lakes by Sawtooth Fish Hatchery from late August through early September 2000.

High Mountain Lakes Stocking:

Site	Number
Alpine Creek Lake #6	300
Alpine Creek Lake #7	350
Alpine Creek Lake #12	50
Baldwin Creek Lake	350
Bear Creek Lake #1	200
Cabin Creek Lake #3	100
Cabin Creek Lake #4 (Crimson)	600
Cabin Creek Lake #7	200
Cabin Creek Peak Lake #03	150
Cabin Creek Peak Lake #04	150
Cliff Creek Lake #01	150
Cliff Creek Lake #04	100
Collie Creek Lake #01	1,075
Decker Creek Lake #01	175
Elizabeth Lake	500
Elk Lake	400
Finger Lake #03 (Fall Creek Lake #3)	475
Fishook Creek Lake #02	100
Fishook Creek Lake #03	100
Goat Lake #01	2,825
Goat Lake #04	400
Goat Lake #05	100
Hanson Lake #01	225
Hanson Lake #03	675
Hanson Lake #05	125
Harlan Creek Lake #01	300
Harlan Creek Lake #02	250
Hasbrook Lake #01	375
Helldiver Lake	550
Hidden Lake	250
Imogene Lake #02	200
Imogene Lake #03	625
Imogene Lake #04	100
Imogene Lake #05	200
Imogene Lake #06	525
Iris Lake #01	225
Kidney Lake #02	150
Knapp Lake #07	200
Lola Lake #02	500
Lola Lake #03	500
Loon Creek Lake #03 (Fish Lake)	150

Appendix 2. continued

Site	Number
Loon Creek Lake #11	175
Loon Creek Lake #13	225
Loon Creek Lake #15	175
Lost Lake	200
Lower Island Lake	550
Lucille Lake	775
Marshall Lake #02	600
Martha Lake	200
McGowan Lake #03	300
P-38 Lake	325
Parks Peak Lake #01	500
Profile Lake	500
Rocky Lake	450
Saddleback Lake #01	300
Saddleback Lake #02	300
Seafoam Lake #06	600
Soldier Lake #04	975
Soldier Lake #07	250
Soldier Lake #08	250
Soldier Lake #10	250
Soldier Lake #11	250
Tango Lake #04	675
Tango Lake #06	900
Thompson Cirque Lake	900
Upper Cramer Lake	275
Upper Hell Roaring Lake #01	200
Upper Hell Roaring Lake #02	250
Upper Redfish Lake #02	325
Upper Redfish Lake #03 (Kathryn)	600
Valley Creek Lake #02	400
Vanity Lake #03	275
Vanity Lake #05	125
Totals	**28,050**

IDAHO DEPARTMENT OF FISH AND GAME

RESIDENT HATCHERIES

FISH HEALTH REPORT 2000

Douglas R. Burton, Fishery Pathologist

INTRODUCTION

The Resident Hatchery Pathologist's (RHP) primary duties are to provide fish health inspection and diagnostic services to the Idaho Department of Fish and Game's (Department) resident fish hatcheries, and to assist hatchery personnel in maintaining good health in cultured resident fish. These same services are provided to Department fishery managers and biologists and occasionally to private individuals or companies when the information or relationship is of benefit to the Department. The author, Douglas R. Burton, held the RHP position for calendar year 2000. The RHP and Anadromous Hatchery Pathologist, A. Douglas Munson, work closely together, often assisting each other in their respective programs and coordinating efforts when those programs overlap. Both individuals are certified as Fish Health Inspectors by the American Fisheries Society. Both pathologists work out of the Eagle Fish Health Laboratory (EFHL) and are supported by the personnel and facilities there.

The RHP is the Investigational New Animal Drug (INAD) monitor for the Department resident hatcheries. This is the process by which the US Food and Drug Administration (USFDA) will allow the limited use of certain drugs and chemicals not currently labeled for a specific use in food fish, while accumulating data to support adding such use to the label. The Department joined the US Fish and Wildlife Service's (USFWS) INAD program in 1998. Two chemicals used by resident hatcheries under this program during 2000 were Chloramine-T (Chlor-T) and Oxytetracycline (OTC). Chloramine-T is used as a bath to treat bacterial infections on the gills (external), and OTC is used to treat systemic bacterial infections. Statewide, the most significant diseases in Department resident hatchery fish are bacterial coldwater disease (CWD), caused by *Flavobacterium psychrophilum*, and motile aeromonad septicemia (MAS), caused by several species of both *Aeromonas* and *Pseudomonas* bacteria. Both diseases are caused by motile, gram-negative bacteria that are usually susceptible to OTC. However, MAS can legally be treated under the existing label, while treatment of CWD always requires an INAD protocol. The total number of INAD protocols to treat CWD at resident hatcheries in 2000 was nearly four times that of 1999 (a list of all acronyms used in this report is included in Appendix M).

The RHP and EFHL personnel examined 87 cases for Department resident hatchery programs during 2000 (27 routine hatchery inspections, 18 inspections of feral brood stock, and 42 diagnostic cases). A summary of the work at each Department hatchery, as well as the results of all sampling done at those hatcheries, are as follows.

AMERICAN FALLS HATCHERY

Five diagnostic inspections documented CWD as the single significant clinical disease at American Falls Hatchery in 2000 (Appendix A). These were the first significant epizootics of this disease in four production years. Low densities and reduced stress were the factors credited during the three previous years of no clinical CWD, but this year's losses were observed in lots of fish held at extremely low densities. The fish were successfully treated with OTC at the standard label dose and duration under INAD protocols. Prior to the epizootic-free years, it was becoming necessary to use higher doses and longer treatment duration for the same result. These good responses indicate that the trend toward antibacterial resistance at this hatchery may have been reversed by three years of drug abstinence.

Catchable-size groups of rainbow were inspected for pathogens, and evaluated using an organosomatic index to provide baseline data for the second year of Douglas Megargle's research study comparing the return-to-creel of fish from three Department hatcheries (see Hagerman State Hatchery and Nampa Hatchery). A carrier state of *F. psychrophilum* was the only significant pathogen detected.

ASHTON HATCHERY

Ashton Hatchery was visited once in 2000. Populations of rainbow and cutthroat trout fingerling were sampled for routine inspection (Appendix B). No replicating viruses, bacteria, or *Myxobolus* spores were detected from either population. The hatchery manager reported that the monogenetic trematode *Gyrodactylus* continues to be a chronic problem, but never caused mortalities great enough to treat. Ashton continues to be a hatchery at risk for *M. cerebralis* contamination. As more natural waters in the vicinity are shown positive for the parasite, the greater the probability that the spring and stream above the hatchery intake will become contaminated.

CABINET GORGE HATCHERY

Two visits were made to the Cabinet Gorge Hatchery in 2000, one in May to diagnose losses in production kokanee, and again in December to inspect spawning kokanee at the Sullivan Springs trap (Appendix C). Bacterial gill disease (BGD) was the diagnosis in May, and fish were successfully treated with a combination of Chlor-T (under INAD protocol), density reduction, and changes in feed type and regimen. The condition of spawning kokanee at Sullivan Springs appeared very good, with an observed occurrence of encysted cestodes in the pyloric cecae and nematodes in the swim bladder similar to past years. There have never been any gross signs indicating that these parasites cause significant adverse effects on the fish. Historically, *Renibacterium salmoninarum* (RS) antigen has been detected in this population using the enzyme-linked immunosorbent assay (ELISA), but the presence of viable organisms has never been demonstrated by the fluorescent antibody test (FAT). Only FAT was used this year due to a shortage of good reagents for ELISA at EFHL. No RS organisms, the causative agents of bacterial kidney disease (BKD), were detected.

CLARK FORK HATCHERY

Westslope cutthroat juveniles at Clark Fork Hatchery were sampled in February 2000 (Appendix D). A mixed bacterial infection of *Flavobacterium, Aeromonas,* and *Pseudomonas* species was diagnosed. The fish were treated with OTC-medicated feed under the existing label. No other fish were sampled during the course of the year.

Due to the combined factors of tight budgets, pathogens in the feral fish in the main water supply at Clark Fork Hatchery, and very cold water temperatures that lead to poor growth rates, it was decided to close down operation of the hatchery. The last production fish reared

on-station were stocked out during the summer of 2000. The future of fish production on the facility is uncertain, but may be limited to natural kokanee spawning in gravel channels.

CLEARWATER HATCHERY

Two diagnostic cases were conducted on the same lot of Hayspur-strain rainbow trout at Clearwater Hatchery (Appendix E). The first sample, taken June 5, detected *Aeromonas hydrophila.* No treatment was applied. The second sample, taken seven weeks later, detected *F. psychrophilum*. Oxytetracycline was applied in medicated feed under an INAD protocol at standard dosage. Success was limited at best. The isolate of *F. psychrophilum* should have been susceptible, as indicated by *in vitro* tests, but the possibility of a mixed infection could explain the poor response. Historically, rainbow trout have not responded well to treatment at this hatchery. Better success may be achieved with next similar episode by treating earlier with a higher dosage and longer duration.

GRACE HATCHERY

Grace Hatchery was visited once in November to inspect fingerling-size rainbow trout (Appendix F). A carrier state of *F. psychrophilum* was detected, but no replicating viruses or *Myxobolus* spores were detected. Production was significantly reduced at Grace for a good portion of the year due to reconstruction of the spring collection facilities and pipelines. Covering the main springs and most of the ditch from the springs to the hatchery should significantly reduce the chance of pathogen introduction by wildlife vectors. But the remaining short section of open ditch and the open middle springs mean that the chance has not been completely eliminated.

HAGERMAN STATE HATCHERY

A total of 26 diagnostic and 4 inspection cases were examined from Hagerman State Fish Hatchery in 2000 (compared to 21 and 2 in 1999; see Appendix G). Catchable-size Kamloops trout on both the Riley Creek and Tucker Springs water sources were inspected for pathogens and evaluated using an organosomatic index to provide baseline data for Douglas Megargle's research study comparing the return-to-creel of fish from three Department hatcheries (see American Falls Hatchery and Nampa Hatchery). Carrier levels of *Aeromonas/Pseudomonas* bacteria were the only pathogens detected in those fish.

Losses from rainbow/Kamloops lots in the outside raceways frequently involved a combination of pathogens. Infectious Hematopoietic Necrosis Virus (IHNV) was detected nine times, often in combination with one or more bacterial pathogens (*F. psychrophilum*, *F. columnare, A. hydrophila,* or *A. sobria*). The hatchery personnel observed several additional IHN episodes without calling on the EFHL for diagnostic confirmation. Several bacterial infections, primarily CWD and MAS, were diagnosed without the complication of virus. These episodes were treated with OTC-medicated feed, using the existing label or an INAD protocol,

whichever was appropriate for the situation. Most of the treatments were successful. The number of INAD protocols to treat CWD was greatly increased in 2000.

Aeromonas salmonicida, the causative bacteria of furunculosis, was again detected at Hagerman in 2000. This pathogen was first detected at Hagerman in 1998, but not in 1999. The epizootic was treated successfully with Romet-30 incorporated in feed, under the existing label for the drug.

HAYSPUR HATCHERY

The RHP's work at Hayspur Hatchery involved considerable effort to inspect broodstock and broodstock replacement lots. The BY98 replacement rainbow (R9) and Kamloops (K1) populations were inspected in August and September (Appendix H). No viruses, *Myxobolus* spores, or significant bacteria were detected. In past years, similar populations of fish have tested positive for RS antigen at low levels by ELISA. However, due to a critical shortage of good ELISA reagents at EFHL, this year's fish were tested by FAT only. No RS was detected.

All BY99 replacement R9s and K1s were given a bath vaccination, using an autogenous *F. psychrophilum* bacterin, when fish ranged from 1.0 to 7.2 grams in size. In addition, half of the R9s received a booster bath about five months later. The bacterin was produced from a bacteria isolate taken at Hayspur in 1998, by Aqua Health Ltd., Charlottetown, P.E.I., Canada. None of the fish have shown signs of bacterial disease to date, and mortalities have been minimal. Since there were no control fish available, the benefit of the treatment is unproven. However, this is a direction for CWD control that will receive much more effort in the coming year.

Intensive sampling and culling of the replacement broodstock pairings continued to be the health priority at Hayspur Hatchery. Ovarian fluids were collected from every female used in the pairings for virology and for RS analysis, using the ovarian cell pellet fluorescent antibody test (OCP-FAT). A portion of the females from each set of pairings was sacrificed for ELISA and tissue virology. Eggs from individual females were held in isolation until the test results were available. If the parent female tested positive for any virus, or for RS by OCP-FAT, the resulting group of eggs was culled. Fish tested by ELISA are considered to be RS-positive when the optical density (OD) is $\geq$0.100; however, it is unlikely that vertical transmission occurs at this very low level. Thus, the egg culling criterion for ELISA results was set at OD $\geq$0.110, with the hatchery manager given the option of culling eggs from any fish at his discretion. Results from these samplings are as follows:

Hayspur Rainbow

The R9 broodstock replacement spawning began on October 11 and ended December 20. Ovarian fluids from 200 females were tested for viruses and RS, and 60 of those same females were sacrificed for ELISA and tissue virology. No viruses were detected from either ovarian fluids or tissues. Three fish (5.0%) tested positive for RS by ELISA, but eggs from only one of these fish were culled. Samples from five fish on one sample date detected fluorescing organisms by OCP-FAT. Some of those organisms were of size and morphology consistent with RS, but some were slightly larger. Samples from the same fish were all negative by ELISA,

which is generally considered to be a more sensitive test than FAT. These results may have been due to the presence of cross-reacting bacteria species, such as *Pseudomonas fluorescens*, instead of RS. Because the evidence was not conclusive, and in order to stay consistent with policy, eggs from those fish were culled from the replacement program. Eggs from a total of six pairs (3%) were discarded over the course of the season.

Hayspur Kamloops

Kamloops broodstock replacement spawning ran from October 18 to November 29. Ovarian fluids from 128 females were tested for viruses and RS, with 49 sacrificed for ELISA and tissue virology. No viruses were detected from either ovarian fluids or tissues. None of the females tested positive for RS by OCP-FAT, but 18 were positive for antigen by ELISA. Eggs from six ELISA-positive females were discarded (4.7% of the pairs).

HENRYS LAKE HATCHERY

Fish health inspection samples were taken from spawning cutthroat trout at Henrys Lake Hatchery from March 6 through April 27, 2000 (Appendix I). Ovarian fluids were collected by hatchery personnel and shipped to EFHL where they were tested for viruses (280 females in 40 seven-fish pools) and RS by OCP-FAT (1,307 females in 165 seven-fish pools, 22 six-fish pools, and 20 individual samples). A group of 60 fish (both males and females) were sacrificed for kidney FAT, tissue virology, bacteriology (16 fish) and *Myxobolus* tests. As part of her senior project Summer Macey, a student from Albertson College of Idaho, assisted on the distribution of whirling disease in the Henrys Fork Drainage. No viruses were detected in any of the tissue or ovarian fluid samples. Two pools of ovarian fluids tested positive for RS by OCP-FAT, and eggs from those pools were discarded. All of the kidney FAT samples were negative. Due to a shortage of good reagents at the laboratory, no tissues were tested for RS by ELISA. Bacteriology samples showed carrier-level infections of *F. psychrophilum* from 5 of 16 fish, and *Pseudomonas fluorescens* from two fish. No other bacterial pathogens were detected. *Myxobolus cerebralis* spores were detected in 9 of 12 five-fish pools. This is of concern in that the prevalence of the parasite in the population seems to be increasing. Clinical signs, primarily dished and shortened craniums, were observed.

MACKAY HATCHERY

No significant clinical disease or fish losses occurred at Mackay Hatchery in 2000. The RFP visited the hatchery twice during the year, sampling fingerling kokanee and rainbow trout in June, and fingerling Henrys Lake cutthroat in September (Appendix J). No replicating viruses, RS, or *Myxobolus* spores were detected. The only pathogen detected was a carrier state of *P. fluorescens* bacteria in the rainbow trout. The hatchery remains at risk from contamination from *M. cerebralis*, due to the very close proximity of positive fish in the outflow stream and settling pond. The probability of detecting such contamination is extremely low due to the design of the hatchery and the likely low levels of prevalence and intensity.

Mackay Hatchery received green eggs from the early-spawning kokanee in Deadwood Reservoir. The spawning population was inspected on September 1. No viruses or *Myxobolus* spores were detected in samples from 69 fish. Sixty fish were tested by the FAT method and no RS bacteria were detected. Due to the shortage of good ELISA reagents at the laboratory, only three pools (x3) of these adults were tested by this method. All three pools were positive for RS antigen at very low levels, which is consistent with the history of this population.

NAMPA HATCHERY

Bacterial CWD and MAS, primarily *A. hydrophila* or *A. sobria*, continue to be the most common diseases diagnosed in Kamloops or rainbow trout at Nampa Hatchery (Appendix K). Outbreaks of MAS in Hayspur rainbow reared in the small "A" raceways were frequent in the spring and early summer. The hatchery was at full production, and heavy loading may have been a contributing factor to these episodes. Treatments with OTC-medicated feed on the existing label were moderately successful, at best. Two epizootics of CWD were treated under INAD protocols with better success.

Catchable-size Kamloops trout were inspected for pathogens and were evaluated using an organosomatic index. This was done to provide baseline data for Douglas Megargle's research study comparing the return-to-creel of fish from three Department hatcheries (see American Falls Hatchery and Hagerman State Hatchery). A carrier state of *F. psychrophilum* was detected in one lot of these fish.

ACKNOWLEDGMENTS

I wish to acknowledge my anadromous counterpart, Doug Munson, and my supervisor, Keith Johnson, for their assistance in the field and for sharing their considerable knowledge with me. The efforts of Fishery Technologists Carla Hogge, Sharon Landin, and Roberta Scott are greatly appreciated. Their timely and accurate results from the laboratory are essential in diagnosing and treating fish health problems in the field. Doug Marsters, Utility Craftsman, was a great help in keeping EFHL's physical plant operating and in keeping my Dodge pickup on the road. The Lab Secretary, Elaine Cavenaugh, contributed her computer skills and kept the mounds of paperwork moving. Finally, I wish to acknowledge the Hatchery Managers and personnel with whom I work. Their cooperation is greatly appreciated, and I sincerely hope my efforts have been a benefit to their programs.

APPENDICES

Appendix A. Summary report of Eagle Fish Health Laboratory results for American Falls Fish Hatchery, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
1999	Troutlodge	Kamloops trout - 3N	00-035	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *Flavobacterium psychrophilum* 8/8
1999	Troutlodge	Kamloops trout	00-077					-	-	+	-			DX: CWD; *F. psychrophilum* 5/5
1999	Troutlodge	Kamloops trout - 3N	00-078					-	-	+	-			DX: CWD; *F. psychrophilum* 3/4
1999	Troutlodge	Kamloops trout	00-100	-	-		-	-	-	+	-			IX: CWD (carrier); VIRO 0/20, FAT 0/20, *F. psychrophilum* 1/12
1999	Troutlodge	Kamloops trout	00-101	-	-		-	-	-	+	-			IX: CWD (carrier); VIRO 0/20, FAT 0/20, *F. psychrophilum* 1/12
2000	Hayspur	Rainbow trout	00-142					-	-	+	-			DX: CWD; *F. psychrophilum* 5/5
1999	Hayspur	Kamloops trout	00-143					-	-	+	-			DX: CWD; *F. psychrophilum* 2/5

Appendix B. Summary report of Eagle Fish Health Laboratory results for Ashton Fish Hatchery, January 1 – December 31, 2000

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
2000	Hayspur	Rainbow trout	00-383	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/8, WHD-DIGEST 0/60
2000	Henrys Lake	Cutthroat trout	00-384	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/8, WHD-DIGEST 0/60

Appendix C. Summary report of Eagle Fish Health Laboratory results for Cabinet Gorge Fish Hatchery, January 1 – December 31, 2000

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
2000	Sullivan Springs	Kokanee	00-127	-	-			-	-	-				DX: BGD; VIRO 0/15, *Aeromonas hydrophila* 3/3 (from gills)
Brood	Sullivan Springs	Kokanee	00-423	-	-	-	-	-	-	+	-	-		IX: CWD (carrier); VIRO /60, FAT 0/60, *Flavobacterium psychrophilum 5/8,* WHD-DIGEST 0/60

Appendix D. Summary report of Eagle Fish Health Laboratory results for Clark Fork Fish Hatchery, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
1999	Clark Fork	Cutthroat trout	00-025	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/8, *Flavobacterium psychrophilum* 5/8, *Pseudomonas pseudomallei* 3/8, *Aeromonas hydrophila* 2/8

Appendix E. Summary report of Eagle Fish Health Laboratory results for Clearwater Fish Hatchery Resident Program, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
2000	Hayspur	Rainbow trout	00-152	-	-			-	-	-	+			DX: MAS; VIRO 0/10, *Aeromonas hydrophila* 4/8
2000	Hayspur	Rainbow trout	00-185	-	-			-	-	+	-			DX: CWD; VIRO 0/10, *Flavobacterium psychrophilum* 4/8

Appendix F. Summary report of Eagle Fish Health Laboratory results for Grace Fish Hatchery, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
2000	Hayspur	Rainbow trout	00-385	-	-		-	-	-	+	-	-		IX: CWD (carrier); VIRO 0/59, FAT 0/59, *Flavobacterium psychrophilum* 1/8, WHD-DIGEST 0/60

Appendix G. Summary report of Eagle Fish Health Laboratory results for Hagerman State Fish Hatchery, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
2000	Hayspur	Rainbow trout	00-007	-	-	-		-	-	+	+			DX: MAS, CWD; VIRO 0/5, *Aeromonas hydrophila* 3/4, *Aeromonas caviae 2/4, Flavobacterium psychrophilum* 1/4
1999	Troutlodge	Kamloops trout	00-008	-	-	-		-	-	+	-			DX: CWD; VIRO 0/4, *F. psychrophilum* 2/4
1999	Troutlodge	Kamloops trout	00-009	-	-	-		-	-	+	+			DX; CWD, MAS; VIRO 0/5, *F. psychrophilum* 2/4, *Pseudomonas mallei* 1/4
1999	Hayspur	Rainbow trout	00-018	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 3/4
2000	Hayspur	Kamloops trout	00-019	-	-			-	-	+	-			DX: CWD; VIRO 0/6, *F. psychrophilum* 4/4
1999	Troutlodge	Kamloops trout	00-020	+	-	-		-	-	+	-			DX: IHN, CWD; IHNV 1/1(x4), IPNV 0/4, *F. psychrophilum* 3/4
2000	Hayspur	Rainbow trout	00-027	-	-			-	-	+	-			DX: CWD; VIRO 0/4, *F. psychrophilum* 2/4
2000	Hayspur	Rainbow trout	00-028	-	-			-	-	+	-			DX: CWD; VIRO 0/4, *F. psychrophilum* 4/4
1999	Troutlodge	Kamloops trout	00-029	+	-			+	-	+	-			DX: IHNV, FUR, CWD; IHNV 1/1 (x5), IPNV 0/5, *Aeromonas salmonicida* 2/5, *F. psychrophilum 2/5*

Appendix G. Continued

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
2000	Hayspur	Rainbow trout	00-043	-	-									DX: COS; VIRO 0/5, *Ichthyobodo necator* 2/2
1999	Hayspur	Rainbow trout	00-044	-	-			-	-	+	-			DX: CWD, BACTEREMIA; VIRO 0/10, *F. psychrophilum* 6/8, *Plesiomonas shigelloides 2/8*
1999	Hayspur	Kamloops trout	00-045	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/10, *F. psychrophilum* 7/8, *A. sobria* 1/8
1999	Troutlodge	Kamloops trout	00-046	+	-			-	-	+	+			DX: EGD, IHN, CWD, MAS; IHNV 3/3 (x2), IPNV 0/6, Gill fungus 6/6, *A. sobria* 6/6, *F. psychrophilum* 3/6
1999	Troutlodge	Kamloops trout	00-106	-	-		-	-	-	-	+			IX: MAS; VIRO 0/20, FAT 0/20, *A. caviae* 1/12, PKX 0/1
1999	Troutlodge	Kamloops trout	00-107	-	-		-	-	-	-	+			IX: MAS; VIRO 0/20, FAT 0/20, *Pseudomonas mallei* 3/12, PKX 0/1
1999	Troutlodge	Kamloops trout	00-108	-	-		-	-	-	-	-			IX: NPD; VIRO 0/20, FAT 0/20, BACTE 0/12
2000	Hayspur	Rainbow trout	00-109	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 4/4
2000	Hayspur	Rainbow trout	00-110	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *F. psychrophilum* 4/4, *A. hydrophila* 1/4
1999	Troutlodge	Kamloops trout – 3N	00-153	+	-			-	-	-	-			DX: IHNV, COL, BGD; IHNV 2/2 (x5), IPNV 0/10, *A. hydrophila* 7/8 (gills), *F. columnare* 7/8

Appendix G. Continued

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
1999	Troutlodge	Kamloops trout	00-163	+	-		-	-	-	+	+			DX: IHNV, CWD, MAS; IHNV 1/1 (x3), IPNV 0/3, FAT 0/3, *Pseudomonas* spp. 3/3, *F. psychrophilum* 3/3
2000	Hayspur	Kamloops trout	00-167	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 4/4
2000	Troutlodge	Kamloops trout – 3N	00-168	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *F. psychrophilum* 4/4, *A. hydrophila* 3/4, *Pasteurella multicida* 3/4
1999	Troutlodge	Kamloops trout	00-169	+	-			-	-	+	-			DX: IHNV, COL, BGD, CWD; IHNV 1/1 (x5), IPNV 0/5, *A. hydrophila* 3/3 (gills), *F. columnare* 2/3 (gills), *F. psychrophilum* 4/4, PKX 0/4
2000	Troutlodge	Kamloops trout	00-386	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 4/4
1999	Troutlodge	Kamloops trout	00-169	+	-			-	-	+	-			DX: IHNV, COL, BGD, CWD; IHNV 1/1 (x5), IPNV 0/5, *A. hydrophila* 3/3 (gills), *F. columnare* 2/3 (gills), *F. psychrophilum* 4/4, PKX 0/4
2000	Troutlodge	Kamloops trout	00-386	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *F. psychrophilum* 4/4
2000	Troutlodge	Kamloops trout – 3N	00-387	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/5, *F. psychrophilum* 3/4, *A. sobria* 1/4
2000	Hayspur	Rainbow	00-388	-	-			-	-	+	-			DX: CWD; VIRO 0/3, *F. psychrophilum* 2/3

Appendix G. Continued

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
2000	Hayspur	Kamloops trout	00-389	+	-			-	-	+	-			DX: IHNV, CWD; IHNV 1/1 (x5), IPNV 0/5, *F. psychrophilum* 3/4
2000	Troutlodge	Kamloops trout – 3N	00-410	-	-			-	-	+	-			DX: CWD; VIRO 0/7, *F. psychrophilum* 4/7
2000	Troutlodge	Kamloops trout – 3N	00-411	+	-			-	-	+	-			DX: IHNV, CWD; IHNV 1/1 (x5), IPNV 0/5, *F. psychrophilum* 3/4
2000	Troutlodge	Kamloops trout – 3N	00-412	+	-			-	-	+	-			DX: IHNV, CWD; IHNV 1/1 (x5), IPNV 0/5, *F. psychrophilum* 3/4

Appendix H. Summary report of Eagle Fish Health Laboratory results for Hayspur Fish Hatchery, January 1-December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
1998	Hayspur	Rainbow trout	00-198	-	-	-	-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/16, WHD-DIGEST 0/60
1997	Hayspur	Kamloops trout	00-199					-	-	-	-			DX: NPD; BACTE 0/1
1998	Hayspur	Kamloops trout	00-286	-	-		-	-	-	-	-			IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/16, WHD-DIGEST 0/60
Brood	Hayspur	Rainbow trout	00-333	-	-	-	+							IX: RS; VIRO 0/20, OCP-FAT 0/20, ELISA 3/10 (ALL LOW, 1 CULLED)
Brood	Hayspur	Kamloops trout	00-345	-	-	-	+							IX: RS; VIRO 0/30, OCP-FAT 0/30, ELISA 2/12 (ALL LOW, 0 CULLED)
Brood	Hayspur	Rainbow trout	00-363	-	-	-	-							IX: NPD; VIRO 0/30, OCP-FAT 0/30, ELISA 0/10
Brood	Hayspur	Kamloops trout	00-382	-	-	-	+							IX: RS; VIRO 0/50, OCP-FAT 0/50, ELISA 5/10 (ALL LOW, 3 CULLED)
Brood	Hayspur	Rainbow trout	00-395	-	-	-	-							IX: NPD; VIRO 0/50, OCP-FAT 0/50, ELISA 0/10
Brood	Hayspur	Kamloops trout	00-398	-	-	-	+							IX: RS; VIRO 0/25, OCP-FAT 0/25, ELISA 1/10 (LOW, 0 CULLED)
Brood	Hayspur	Rainbow trout	00-406	-	-	-	-							IX: NPD; VIRO 0/50, OCP-FAT 0/50, ELISA 0/10
Brood	Hayspur	Kamloops trout	00-413	-	-	-	+							IX: RS; VIRO 0/24, OCP-FAT 0/23, ELISA 10/17 (ALL LOW, 3 CULLED)

Appendix H. Continued

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
Brood	Hayspur	Rainbow trout	00-414	-	-	-	+							IX: RS; VIRO 0/30, OCP-FAT 5/30, ELISA 0/10 (5 FAT-POSITIVES CULLED)
Brood	Hayspur	Rainbow trout	00-426	-	-	-	-							IX: NPD; VIRO 0/20, OCP-FAT 0/20, ELISA 0/10

Appendix I. Summary report of Eagle Fish Health Laboratory results for Henrys Lake Fish Hatchery, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
Brood	Henrys Lake	Cutthroat trout	00-038A				-							IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-038B				+							IX: RS; OCP-FAT 2/15 (x7)
Brood	Henrys Lake	Cutthroat trout	00-038C	-	-	-	-							IX: NPD; VIRO 0/70, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-055A				-							IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-055B				-							IX: NPD; OCP-FAT 0/20
Brood	Henrys Lake	Cutthroat trout	00-055C				-							IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-055D	-	-	-	-							IX: NPD; VIRO 0/70, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-063	-	-	-	-	-	-	+	+	+		IX: CWD, MAS, WHD; VIRO 0/60, *Flavobacterium psychrophilum* 5/16, *Pseudomonas fluorescens* 2/16, FAT 0/60
Brood	Henrys Lake	Cutthroat trout	00-066A	-	-	-	-							IX: NPD: VIRO 0/70, OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-066B	-	-	-	-							IX: NPD: VIRO 0/70, OCP-FAT 0/105

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Appendix I. Continued

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
Brood	Henrys Lake	Cutthroat trout	00-096A				-							IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-096B				-							IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-096C				-							IX: NPD; OCP-FAT 0/105
Brood	Henrys Lake	Cutthroat trout	00-129A				-							IX: NPD; OCP-FAT 0/72
Brood	Henrys Lake	Cutthroat trout	00-129B				-							IX: NPD; OCP-FAT 0/60

Appendix J. Summary report of Eagle Fish Health Laboratory results for Mackay Fish Hatchery, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
1999	Deadwood Reservoir	Kokanee salmon	00-156	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/8, WHD-DIGEST 0/60
2000	Arlee	Rainbow trout	00-157	-	-		-	-	-	-	+	-		IX: MAS; VIRO 0/60, FAT 0/60, *Pseudomonas fluorescens* 1/8, WHD-DIGEST 0/60
Brood	Deadwood Reservoir	Kokanee salmon	00-246	-	-		-					-		IX: NPD; VIRO 0/60, FAT 0/60, WHD-DIGEST 0/60
Brood	Deadwood Reservoir	Kokanee salmon	00-247	-	-		+							RES: RS; VIRO 0/9, ELISA 3/3 (x3, low)
2000	Henrys Lake	Cutthroat trout	00-280	-	-		-	-	-	-	-	-		IX: NPD; VIRO 0/60, FAT 0/60, BACTE 0/8, WHD-DIGEST 0/60

Appendix K. Summary report of Eagle Fish Health Laboratory results for McCall Fish Hatchery Resident Program, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
2000	Westslope Trout Co.	Cutthroat trout	00-215	-	-			-	-	+	-			DX: CWD; VIRO 0/5, *Flavobacterium psychrophilum* 8/8

Appendix L. Summary report of Eagle Fish Health Laboratory results for Nampa Fish Hatchery, January 1 – December 31, 2000.

Brood year	Stock	Species	Accession	IHN	IPN	NAVHS	BKD	FUR	ERM	CWD	MAS	WHD	CSH	Diagnosis
1998	Troutlodge	Kamloops trout	00-001	-	-			-	-	+	-			DX: CWD; VIRO 0/10, *Flavobacterium psychrophilum 5/5*
1998	Hayspur	Rainbow trout	00-002	-	-			-	-	-	-			DX: NPD; VIRO 0/8, BACTE 0/5
2000	Hayspur	Rainbow trout	00-050					-	-	+	+			DX: CWD, MAS; *F. psychrophilum* 4/4, *Aeromonas sobria* 4/4 (lesions), *A. hydrophila* 4/4 (systemic)
2000	Hayspur	Kamloops trout	00-051					-	-	-	+			DX: MAS; *A. hydrophila* 2/4
1999	Troutlodge	Kamloops trout	00-115	-	-		-	-	-	-	-			IX: NPD; VIRO 0/20, FAT 0/20, BACTE 0/12
1999	Troutlodge	Kamloops trout	00-116	-	-		-	-	-	+	-			IX: CWD(carrier); VIRO 0/20, FAT 0/20, *F. psychrophilum* 4/4, *Pasteurella spp.* 1/12
1999	Troutlodge	Kamloops trout	00-117	-	-		-	-	-	-	-			IX: NPD; VIRO 0/20, FAT 0/20, BACTE 0/12
2000	Troutlodge	Kamloops trout - 3N	00-334	-	-			-	-	+	+			DX: CWD, MAS; VIRO 0/10, *F. psychrophilum* 3/8, *Pseudomonas vesicularis* 3/8, *Sphingomonas paucimobilis* 5/8

Appendix M. Definitions of acronyms used in the text or appendices.

Acronym:	Definition:
BACTE	Bacteriology test results
BGD	Bacterial Gill Disease, caused by a number of species; often a result of poor environmental conditions
BKD	Bacterial Kidney Disease, caused by *Renibacterium salmoninarum*
Chlor-T	Chloramine-T; chemical used under INAD protocol to treat BGD
COL	Columnaris disease, caused by *Flavobacterium columnare*
COS	*Ichthyobodo necator*; external parasite formerly classified as *Costia sp.*
CSH	*Ceratomyxa shasta*; enteric parasite
CWD	Coldwater Disease, caused by *Flavobacterium psychrophilum*
DX	Diagnostic examination
EFHL	Eagle Fish Health Laboratory
EGD	Environmental Gill Disease; deterioration of gill tissue due to non-infectious causes
ELISA	Enzyme-linked immunosorbent assay; used at EFHL to detect RS antigen
ERM	Enteric Redmouth Disease, caused by *Yersinia ruckeri*
FAT	Fluorescent antibody test; used most often to detect RS organisms in kidney tissue smears
FUR	Furunculosis, caused by *Aeromonas salmonicida*
IDFG	Idaho Department of Fish and Game
IHN	Infectious Hematopoietic Necrosis disease, caused by IHN virus
IHNV	Infectious Hematopoietic Necrosis virus; presence of virus does not always indicate clinical disease
INAD	Investigational New Animal Drug
IPN	Infectious Pancreatic Necrosis disease, caused by IPN virus
IPNV	Infectious Pancreatic Necrosis virus; presence of virus does not always indicate clinical disease
IX	Inspection examination
K1	Kamloops trout
MAS	Motile Aeromonad Septicemia caused by a number of motile *Aeromonas sp.* and *Pseudomonas sp.* bacteria
NAVHS	North American Viral Hemorrhagic Septicemia; reportable viral disease not yet detected in Idaho
NPD	No Pathogens Detected
OCP-FAT	Ovarian cell pellet fluorescent antibody test
OD	Optical Density; the unit of measure in an ELISA test
OTC	Oxytetracycline
PKX	Proliferative kidney disease-causing organism
R9	Hayspur-strain rainbow trout
RHP	Resident Hatchery Pathologist
RS	*Renibacterium salmoninarum*, causative agent of BKD; used in diagnoses to indicate presence of bacteria without clinical disease
VIRO	Virology test results
WHD	Whirling Disease, caused by *Myxobolus cerebralis*
WHD-DIGEST	Pepsin/trypsin digest method results for *Myxobolus sp*. spores

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